



Windows

CRITTALL · FEDERAL · INC
WAUKESHA · WISCONSIN

CRITTALL - FEDERAL, INC.

WAUKESHA, WISCONSIN



UNIVERSAL CASEMENTS

NORMAN CASEMENTS

STANWIN CASEMENTS

INDUSTRIAL WINDOWS

INDUSTRIAL DOORS

MECHANICAL OPERATORS



To help you please your clients with better jobs—conveniently, on time—this company has made two established lines of steel windows available from one dependable source, to meet every requirement.

Federal industrial windows—with an enviable reputation for quality and service—and Crittall casements in light, intermediate, and heavy classifications—embodying the patents and designs of the world's largest makers of casement windows—are manufactured under one roof and offered to you through one service organization.

This consolidated catalog, including an entirely new line of hardware for Stanwin casements, is designed for your convenience in specifying and detailing steel windows. It provides useful technical data rather than extensive illustration of the finished product.

Other applications and combinations of course are available, and improvements are constantly being made. These are offered as typical, covering the most usual conditions and practice. Engineering service of the Crittall-Federal organization is available promptly and cheerfully to help you meet any special need. Call the nearest representative, or write Crittall-Federal, Inc.



PLANT AND GENERAL OFFICES AT WAUKESHA, WISCONSIN

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Universal Steel Casement Specifications

All windows shall be Universal Steel Casements manufactured by Crittall-Federal, Inc., complete with hardware and erection fittings and in types and sizes as shown on the drawings and as hereinafter specified.

Glass and glazing are specified under "Glazing"; grouting and caulking, under "Masonry Work"; field painting, under "Painting."

Casements shall be made of hot rolled new billet steel. Combined weight of vent and frame sections shall be not less than 4.6 lbs. per lineal foot for Heavy Casements (or 3.45 lbs. for Medium Casements); and combined depth of vent and frame sections front to back in closed position not less than $1\frac{13}{16}$ " for Heavy Casements (or $1\frac{1}{2}$ " for Medium Casements). The table of maximum sizes on Page 7 shall govern the weight of the section to be used.

All corners shall be mitered, electrically butt welded and exposed and contact welded surfaces ground smooth. All weathering contacts shall be rolled integral with the outside frame and vent sections and shall be continuous between parallel flat surfaces of not less than $\frac{1}{4}$ " width at both inside and outside points of closure. Sections shall be so designed that in composite openings glass will be in the same plane in stationary and ventilating units and sight lines will be uniform throughout. Furnish moulded steel glazing beads carefully mitered and file fitted to each pane using countersunk brass attaching screws.

Side hinged vents shall have free extension or close drop forged steel pivot hinges with bronze pins. (Optional) Hinges shall be solid bronze butts with hardened steel pins. (Optional)—Furnish extension or close pivot hinges with special zinc alloy friction washers to eliminate use of sill adjusters. Vents up to 5' 6" high to have solid bronze locking handle; vents

5' 6" high and over shall be furnished with two-throw locking devices.

Projected ventilators shall be balanced on two heavy supporting arms pivoted securely to the ventilator and to the frame. Friction shall be provided by two extruded bronze sliding shoes equipped with coil compression springs encased in steel barrel housings rigidly welded to ventilator section. Projected ventilators shall have cam handles or spring catch to provide for pole operation when out of easy reach from the floor.

Top and bottom hinged ventilators to be equipped with steel pivot hinges or solid bronze butts and shall have peg and stay for top hinged swing out and spring catch and concealed side arms for bottom hinged in ventilators.

Horizontally and vertically pivoted ventilators shall be hung on heavy bronze ring type pivots. Horizontally pivoted ventilators shall be fitted with spring catches for pole operation if friction ring center pivots are used or spring catch and cord if free pivots. Vertically pivoted ventilators shall have one locking handle up to 5' 6" high and two throw locking device over 5' 6"; vertically pivoted vents 3' 0" wide and over shall have locking handles at each jamb.

All steel sections shall be cleaned free from rust, oil and loose scale and painted in shop with two coats rust-inhibitive paint, each coat baked on separately at a temperature of 300 degrees.

Provide screens where required. (See page 12 for screen specifications.)

All casements shall be erected complete into prepared openings by skilled mechanics and bedded in non-staining mastic cement with excess mastic neatly trimmed off.

SUBFRAMES

Subframes will be furnished when specified made of 12 ga. pressed steel with all corners and joints at mullion and transom bars coped or mitered and continuously welded along the entire line of intersection with welds dressed flush on all exposed surfaces. Subframes shall be painted as specified for casements. They shall be set plumb and level and built in and calked by the mason contractor as the walls go up.

BRONZE AND ALUMINUM CASEMENTS

These non-ferrous casements are available in sections similar to the steel casements covered by the foregoing specifications. The sections are assembled by solidly

gas welding corners and carefully cleaning welds free from flux. Finish is generally smooth natural extruded finish, but satin or polished finish is furnished when specified. Hardware is of white metal. Windows and hardware are carefully packed to prevent damage to finish during shipment.

CASEMENT COMBINATION—CASEMENT PROJECTED—NORMAN CASEMENTS

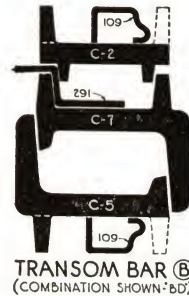
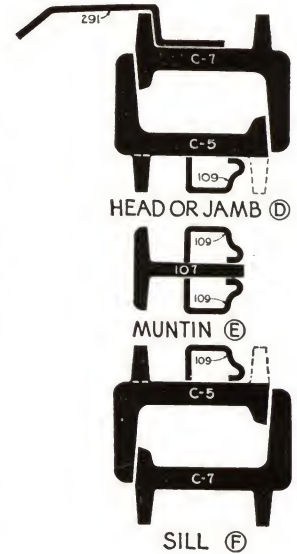
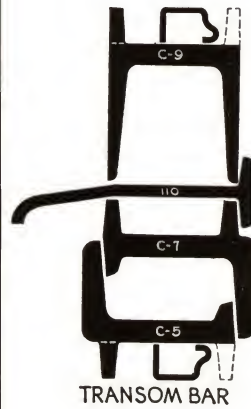
These standardized lines of Universal Medium Casements are particularly suitable for hospitals, schools, office buildings, institutions, and similar buildings and they are described on pages 7, 8 and 9.

Heavy Steel Casement Sections

TYPICAL FULL SIZE



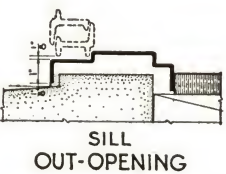
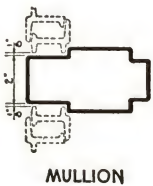
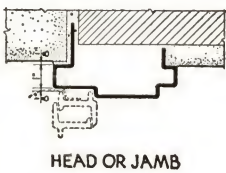
HALF FULL SIZE



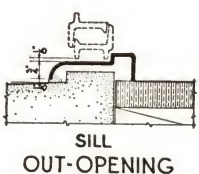
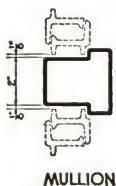
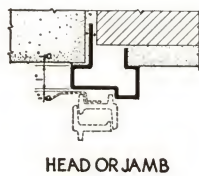
NOTE:
DOTTED LINES SHOW
SECTIONS USED FOR
OUTSIDE PUTTY GLAZING

Steel Casement Subframes

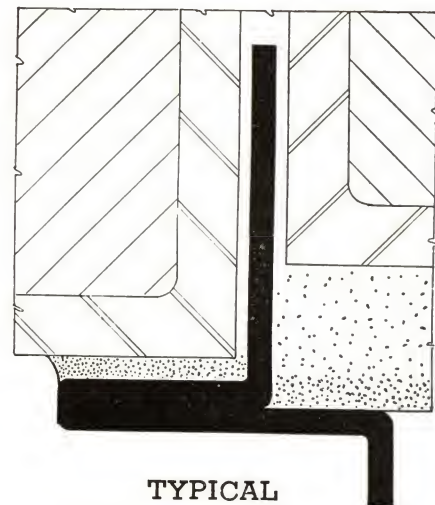
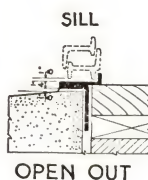
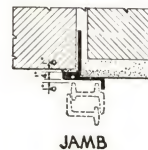
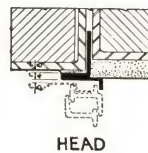
DOUBLE RABBET



SINGLE RABBET

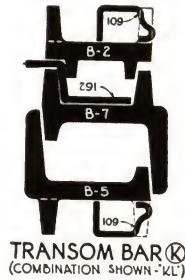
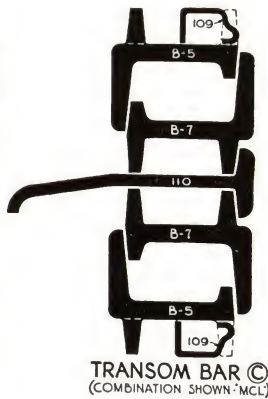
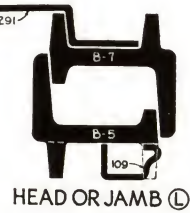
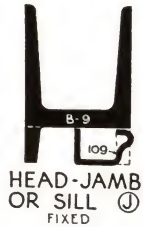


UTILITY FRAMES

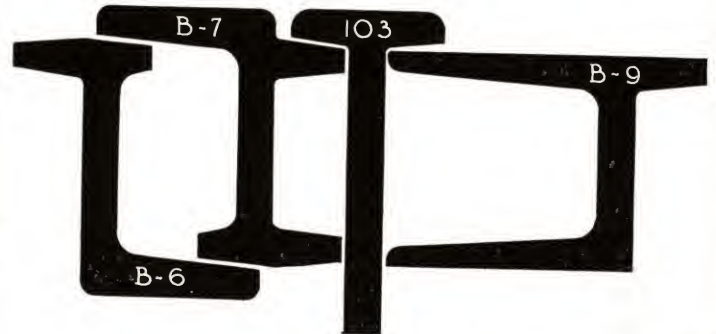


Medium Steel Casement Sections

HALF FULL SIZE



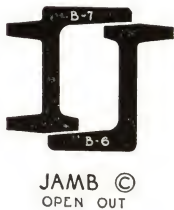
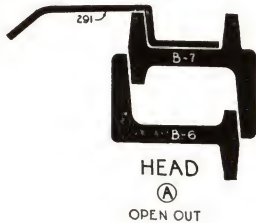
TYPICAL FULL SIZE



NOTE:
DOTTED LINES SHOW
SECTIONS USED FOR
OUTSIDE PUTTY GLAZING

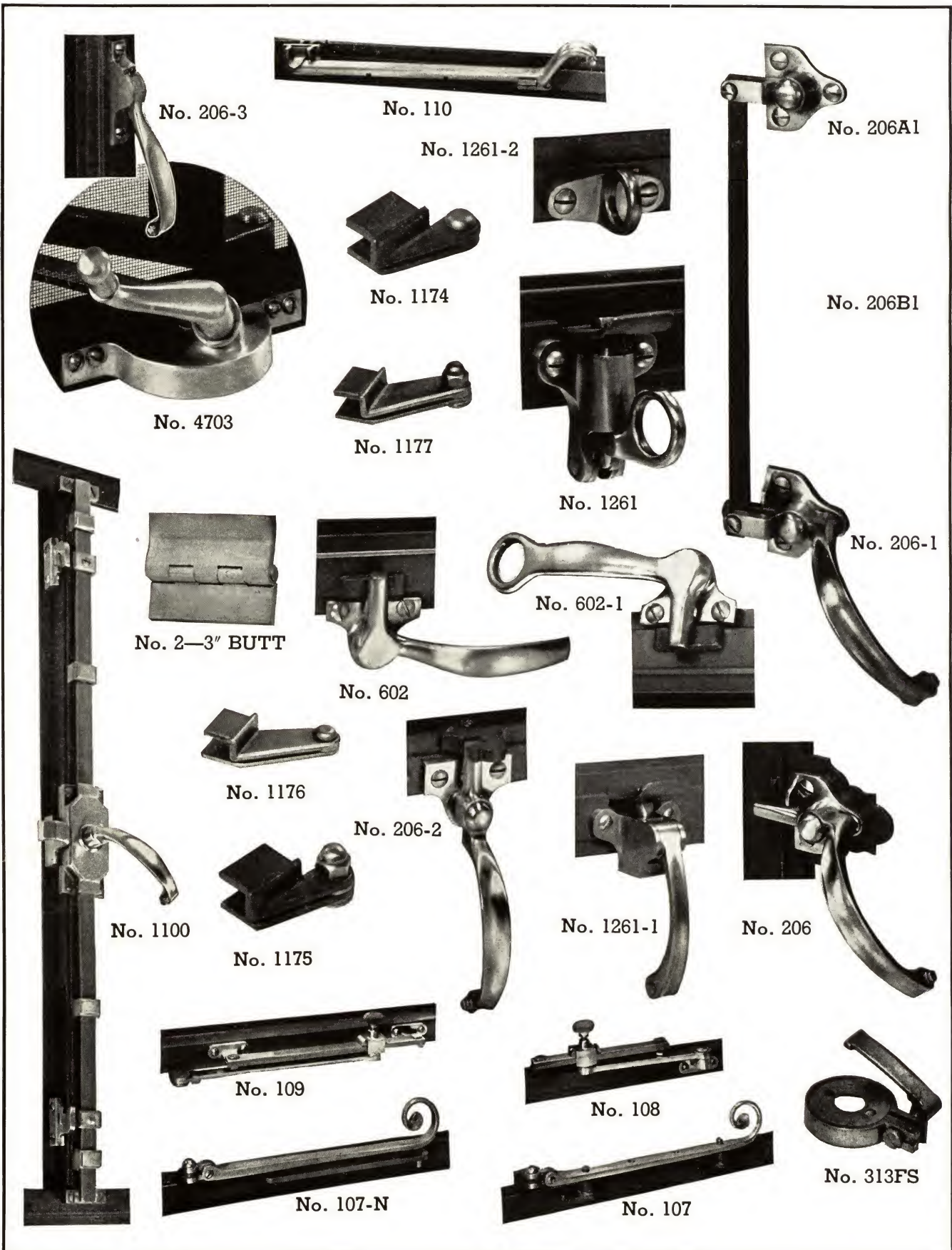
CASEMENT COMBINATION — CASEMENT PROJECTED — NORMAN

HALF FULL SIZE

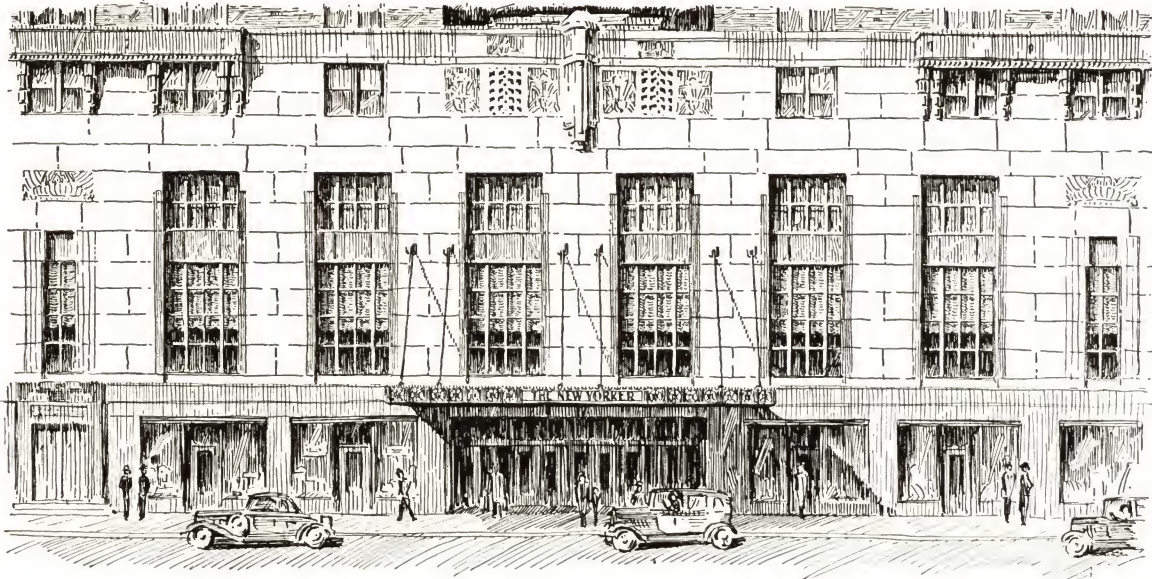


SEE PAGES
7 AND 9
FOR WINDOWS

Universal Casement Hardware

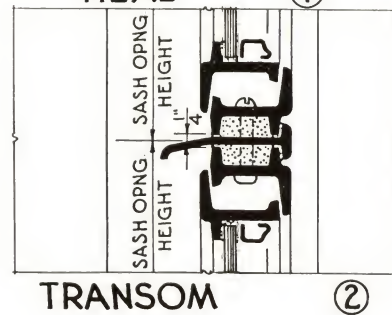
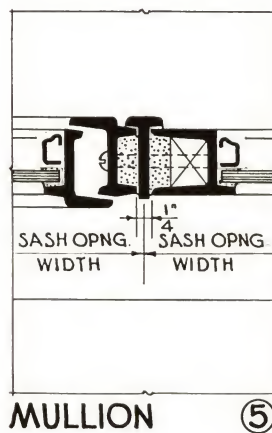
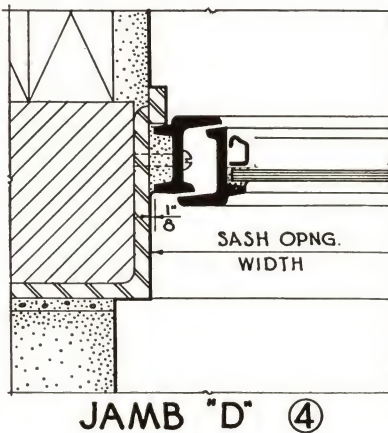
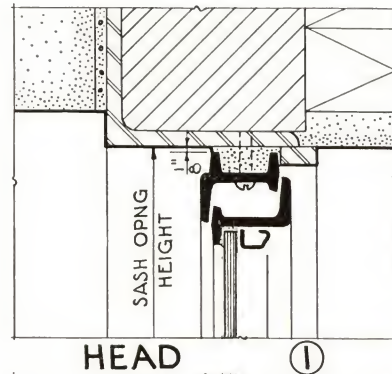
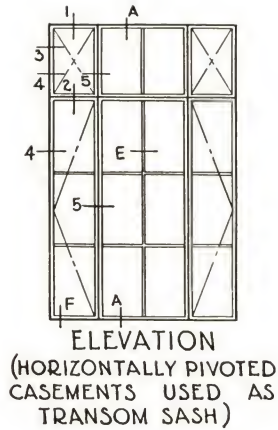
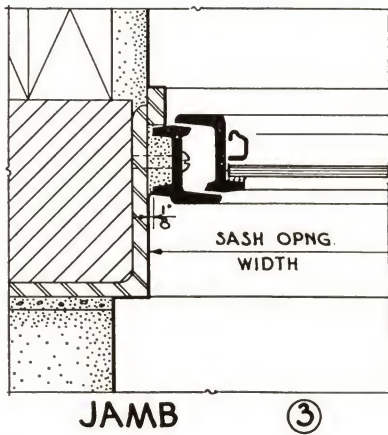


Universal Casement Installation



NEW YORKER HOTEL - NEW YORK CITY

SUGARMAN AND BERGER - ARCHITECTS



NOTE: SECTION NUMBERS REFER TO ELEVATION SHOWN. SECTION LETTERS REFER TO SECTIONS ON PAGE 4

SCALE OF DETAILS - 3" = 1'-0"

Norman Casements

Norman Casements are heavy standard windows, in a wide range of sizes, and are adaptable to use in any type of building. They are a standardization of the medium Universal Casement, a custom-built window, and possess the same characteristics of design and workmanship.

SPECIFICATIONS

All windows shall be Crittall-Federal Norman Casements in standard types and sizes shown on the drawings and as hereinafter specified.

Casements are to be fabricated from steel sections with combined weight of outside frame and vent sections not less than 3.45 lbs. per lineal foot and combined depth front to back in closed position of not less than $1\frac{1}{2}$ ", and shall be arranged for outside putty glazing.

All corners shall be electrically butt welded and exposed and contact welded surfaces ground smooth. Meeting rails and transom bars shall be riveted and welded. Muntins shall be riveted to frames and interlocked at their intersections.

All weathering contacts shall be continuous between parallel flat surfaces of not less than $\frac{1}{4}$ " width at both inside and outside points of closure, without the use of applied or loose weathering linings.

Side hinged vents shall be hung on extended drop forged steel pivots continuously welded to frame and

vent frames. Top hinged vents are hung on close type pivots.

Side hinged vents shall be fitted with polished bronze underscreen locking handles with concealed coil tension springs and roto style adjuster having $\frac{5}{8}$ " diameter worm engaging 4 teeth of heavy, cadmium-plated segment gear. Locking handle and adjuster case and handle shall be solid bronze with statuary finish. Top hinged vent shall have solid bronze underscreen push bar adjuster.

All steel sections shall be cleaned free from rust, oil, and loose scale and painted in shop with two coats rust-inhibitive paint, each coat baked on separately at a temperature of 300 degrees.

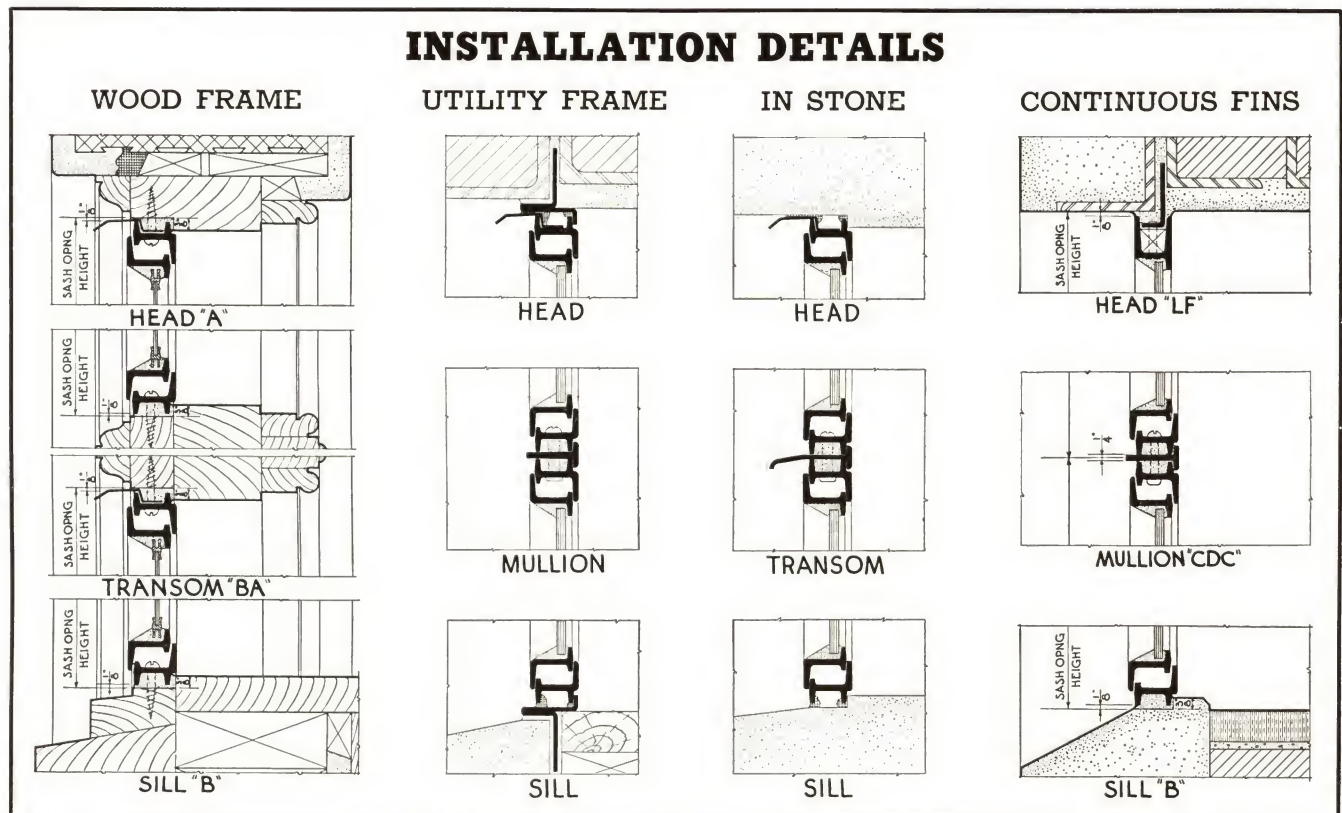
Provide one metal screen for each vent with the screen frame made of one-piece steel section with $\frac{1}{4}$ " diameter solid steel spline, enameled dark grey. Cloth shall be 16 mesh bronze wire. Grommets in cloth will not be permitted.

All casements shall be erected complete into prepared openings by skilled mechanics and bedded in non-staining mastic cement with excess mastic neatly trimmed off.

Where insect screening is not essential, specify friction pivots and solid bronze locking handle on side hung vents and bronze peg and stay adjuster on top hinged vents.

Construction "with sight lines" is furnished when specified—see sections on page 5.

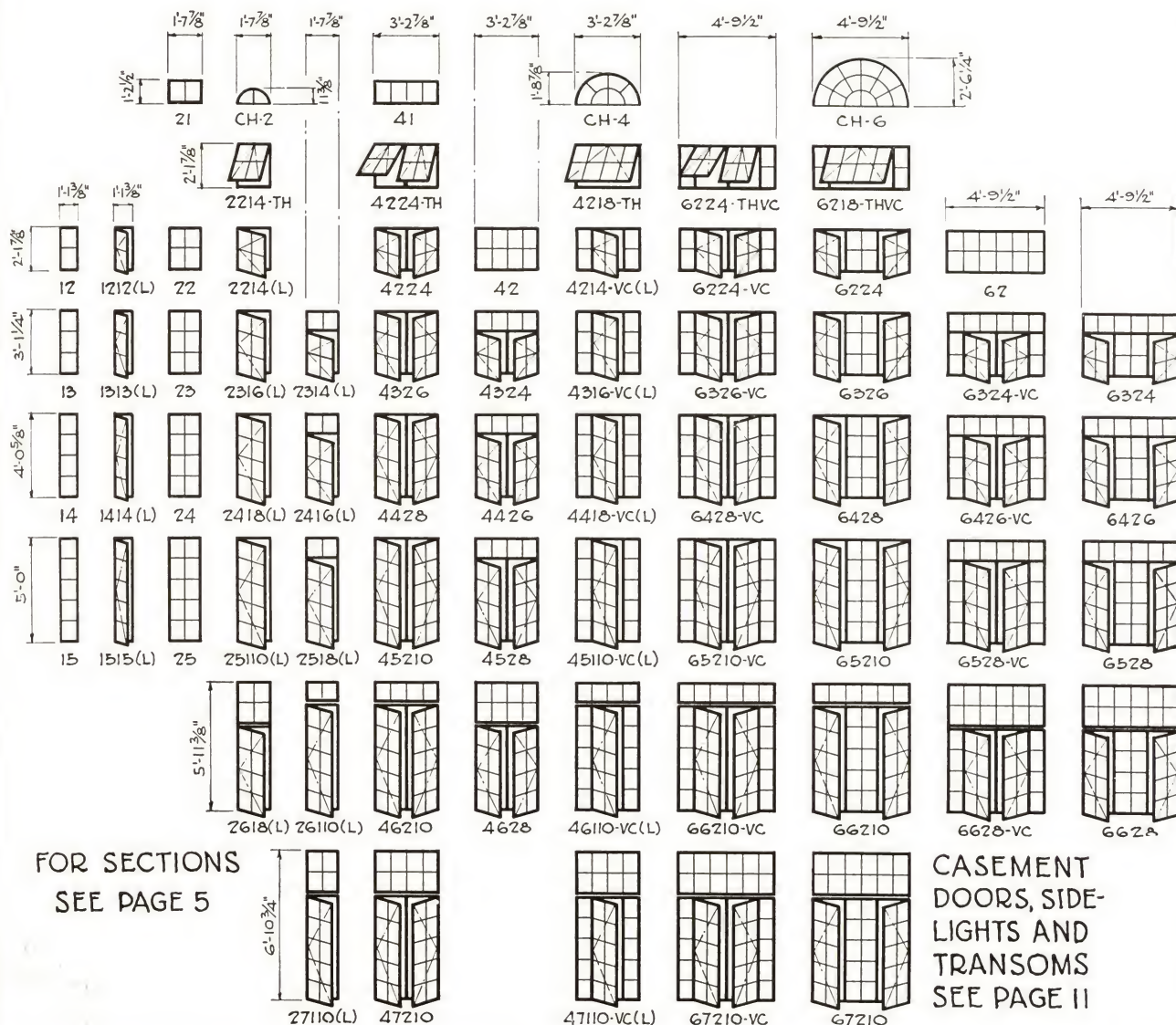
INSTALLATION DETAILS



Norman Casement Types and Sizes

ALL SINGLE SIDE HINGED VENTILATORS SHOWN ON THIS SHEET ARE LEFT HAND (L). EITHER LEFT HAND (L) OR RIGHT HAND (R) CAN BE FURNISHED WHEN SPECIFIED.

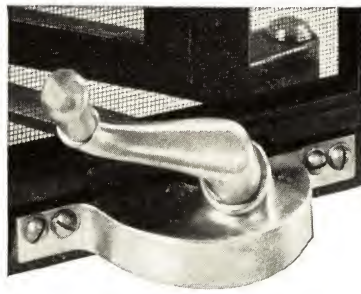
DIMENSIONS SHOWN ARE OPENING DIMENSIONS;



TYPICAL HARDWARE



No. 206-3
ROTO STYLE
LOCKING HANDLE



No. 4703 ROTO STYLE
GEAR ADJUSTER



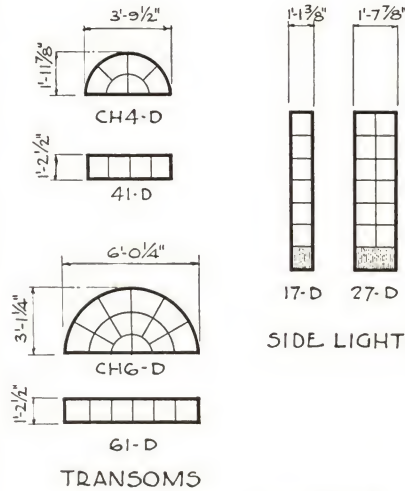
No. 206
SIMPLEX STYLE
LOCKING HANDLE



No. 110
TRANSOM PEG AND STAY

Casement (French) Doors

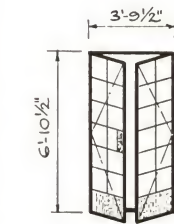
NORMAN DOOR



SIDE LIGHTS

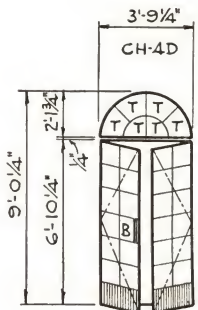
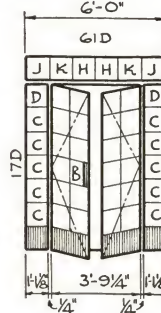
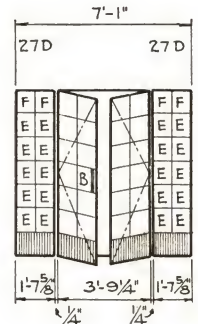
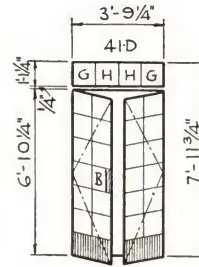
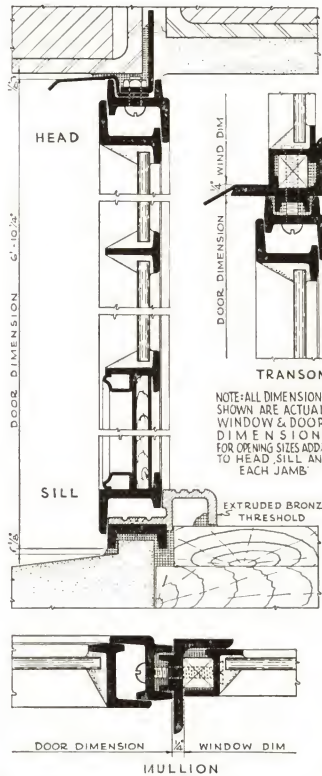
TRANSOMS

SECTIONS ONE-FOURTH FULL SIZE



STANWIN DOOR

Transom and Side Lights

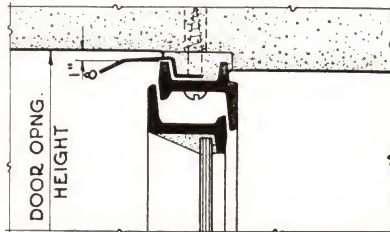


GLASS SIZES

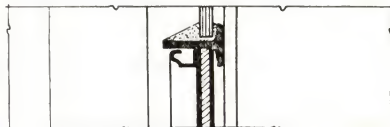
A = 10" x 11"
B = 7 1/2" x 11"
C = 11 3/8" x 11"
D = 11 3/8" x 11 3/8"
E = 8 3/4" x 11"
F = 8 3/4" x 11 3/8"
G = 10 1/2" x 11 3/8"
H = 10 1/2" x 11 3/8"
J = 12 3/8" x 11 3/8"
K = 11 1/2" x 11 3/8"
L = 11 1/2" x 11 3/8"
T = TO TEMPLATE
NOTE: ALL LIGHTS NOT LETTERED SIZE "A"

SECTIONS ONE-FOURTH FULL SIZE

OUT-OPENING



HEAD

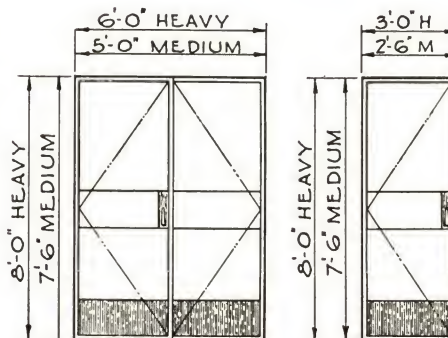


SILL

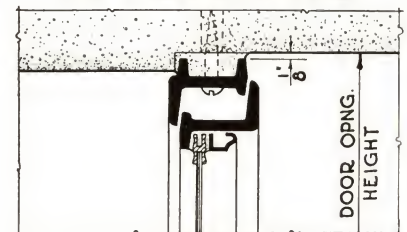
UNIVERSAL MEDIUM and HEAVY DOORS

STEEL CASEMENT DOORS ARE FITTED WITH CONCEALED TYPE CREMONE BOLT LOCK WITH THUMB TURN ON INSIDE, SOLID BRONZE LOCKING HANDLES, TOP AND BOTTOM BOLTS AND STEEL KICK PLATE. BRONZE THRESHOLD AND CYLINDERS FOR LOCK ARE FURNISHED AT AN EXTRA.

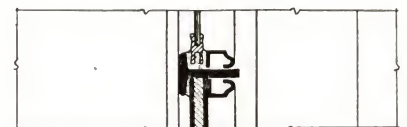
MAXIMUM SIZES



IN - OPENING



HEAD



SILL

Casement Screens

Screens may be applied to all types of casement windows and doors. In selecting the screen and window combination, consideration should be given to appearance, convenience, shades, venetian blinds, draperies, expected frequency of opening and closing the ventilators, economy, and other factors.

ROTO STYLE—SIDE HINGED OPEN OUT WINDOWS

Roto style windows and fixed screens are more widely used than any other combination. The windows themselves are factory prepared especially to receive screens. The hardware is so designed that out opening ventilators are controlled with ease without touching the screen.



No. 4703



No. 206-3

This roto style operator and locking handle are recommended for general use on vents up to 2'3" wide and 5'0" high. For vents exceeding these sizes please consult us.

SCREENS FOR TOP HINGED AND PROJECT OUT AT BOTTOM WINDOWS



No. 110

Stay bar No. 110 permits out opening top hinged and project out at bottom vents to be equipped with fixed screens and the operation of the vents either by hand or by pole without touching the screen.

OTHER SCREENING ARRANGEMENTS

Side hinged screens may be applied directly to the frames of windows with side hinged vents—friction hinges or concealed friction adjusters should be specified for the windows as exposed double bar adjusters will interfere with the screen. Vertically sliding screens are also available.

Vertically and horizontally pivoted windows are furnished with flat screens—one screen on outside

and one on inside of each leaf with closure astragal from pivot to pivot. Ventilator hardware is always applied to the inswinging rail of the window vent.

Screen doors are never connected directly to the casement doors. Double rebated subframes providing rebates for both door and screens and clearance for hardware are recommended. Hanging stiles secured to casement door frame and having rebate for screen door may be used in place of subframe.

SCREEN FRAMES

Frames should be narrow to admit a maximum of daylight and ventilation. Large single screens, however, must have frames wide enough to be rigid and to keep the screen cloth taut. Cross braces are required on screen doors and similar large panels. Screen frames for projected vents are furnished with projecting leg or box to allow screen to clear the toe of the window ventilator on the sliding shoe rail.

SPECIFICATIONS

Solid spline frames—in steel only, recommended maximum size 2'6" x 5'0". Frame is special drawn one-piece steel section .04" thick continuous at all four corners with 1/4" round spline.

Tubular frames—in steel, bronze, or aluminum, 5/8" x 7/16" Tube, recommended maximum size 3'0" x 6'0" with one cross brace. 1 1/8" x 7/16" Tube, recommended maximum size 3'0" x 8'0" with one cross brace.

Frame is rolled from flat stock into rigid tubular shape and assembled by accurately mitering the corners and solidly pressing over heavy stamped corner reinforcing blocks which extend approximately 3" in each direction from each corner. Spline is shell type.

Screen door frames and screen door hardware. Rails and stiles are .032" thick steel tubes, 5/8" thick. Top rails, stiles, and cross braces should be 3" wide. Bottom rail can be arranged to be 6" to 12" in height. Each leaf is hung on three loose pin hinges; the active leaf fitted with bronze latch, lever handles, and air check; the inactive leaf with bronze top and bottom bolts. Closure astragal furnished between door leaves.

Screen cloth shall be 16 mesh, .0113" in diameter, bronze wire. This cloth must be held tautly by removable spline. Edges of spline groove and of the spline are rounded to avoid possibility of cutting the screen cloth.

Combination wire guard and insect screens are similar in all respects to solid spline type frames except 1 1/2" mesh, No. 9 gauge steel wire cloth is attached to screen frame by welding at all contact points. Heavier grilles may require special hardware.

Stanwin Steel Casements

SPECIFICATIONS

All windows shall be Crittall-Federal Stanwin Casements in standard types and sizes shown on the drawings and as hereinafter specified.

Casements are to be fabricated from steel sections with combined weight of outside frame and vent sections not less than 2 lb. per lin. ft. and neither frame nor vent member shall be less than 1" deep.

Frame and vent frame corners shall be electrically butt welded with exposed and contact welded surfaces ground smooth. Meeting rails and transom bars shall be riveted and welded. Muntins shall be solidly riveted to frames and interlocked at their intersections.

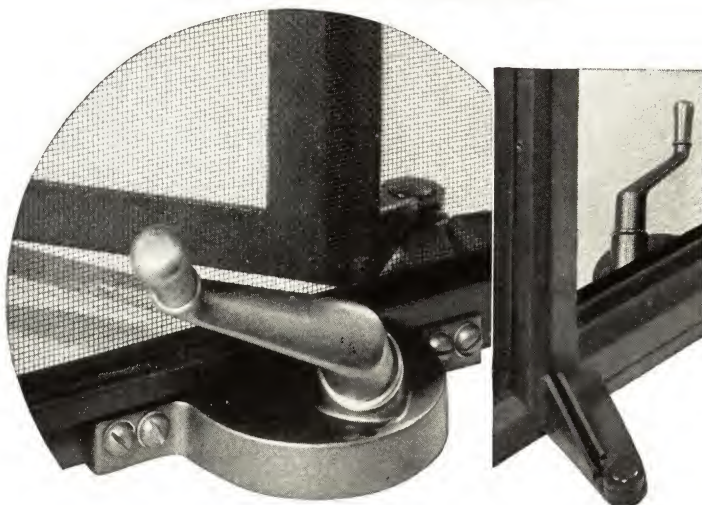
Side hinged ventilators shall be hung on extension

hinges of the angle (bracket) type fully arc-welded both horizontally and vertically along the line formed by hinge leaf abutting the window member. Hinge pins are to be not less than $\frac{5}{16}$ " diameter bronze. Transom and Tilt-in vents shall be hung on steel hinges.

All steel sections shall be cleaned free from oil, rust, and loose scale and painted in shop with two coats rust-inhibitive paint, each coat baked on separately at a temperature of 300 degrees.

All casements shall be erected complete into prepared openings by skilled mechanics and bedded in non-staining mastic cement provided by window manufacturer.

ROTO STYLE HARDWARE

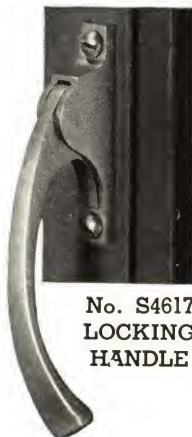


No. 4703 AF GEAR OPERATOR (Front and Back Views)

Provide solid cast bronze lever locking handle—one for each vent. Operators shall be of heavy internal segment gear and worm type with four teeth of the segment in constant engagement with worm. Housing for worm and gear shall be non-ferrous, metallic lacquered to match locking handles. Both locking handles and gear operators shall be so designed that no cut-outs in screen cloth are required.

Top hinged transoms to be provided with screen-type push bar.

Provide one screen for each vent with attachments allowing for easy removal of screen without special tools. Screen frame to be of rewirable type with $\frac{1}{4}$ " solid steel round spline and U-shaped steel frame continuous at all four corners. Cloth to be 16 mesh bronze.



No. S4617
LOCKING
HANDLE

SIMPLEX STYLE HARDWARE



No. S4618
LOCKING HANDLE

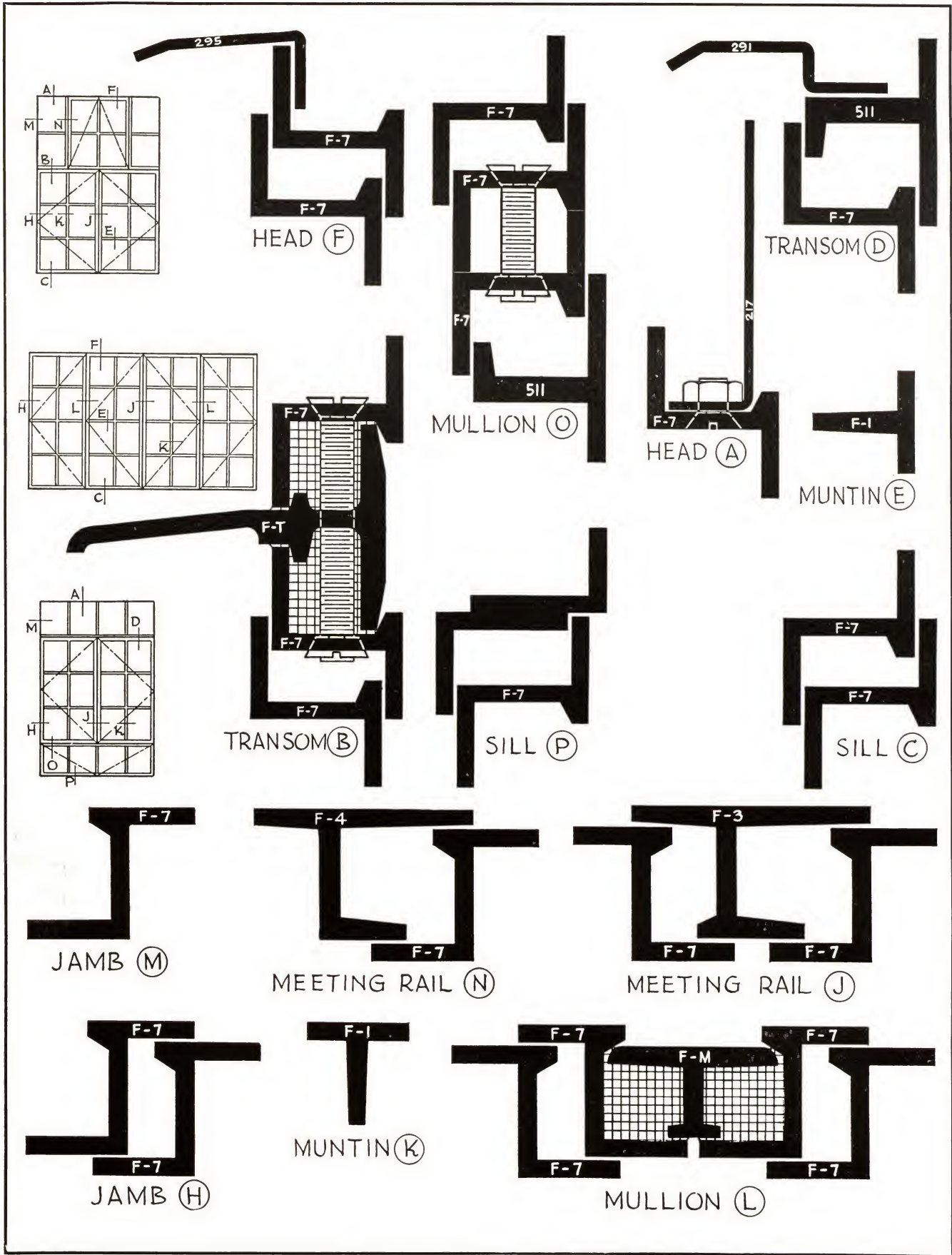
Provide solid cast bronze lever locking handle attached to vent frame engaging in closed position with bronze, wedge shaped, strike attached to outside window frame.

Hinges to be of adjustable friction type which eliminates the need of separate stay-bar or adjuster.

Screens to be wicket type with steel frame having solid $\frac{1}{4}$ " round spline and 16 mesh bronze cloth. Screen frame to be of proper depth to clear casement hardware and sliding wicket to provide ready access for opening and closing window ventilator. One screen to be furnished for each single side hinged vent and one screen to be furnished for each pair of adjacent side hinged vents.

(Option) Side hinged screens may be had instead of wicket type. Windows with fixed transoms should be detailed to avoid interference between hinged screen and shades or draperies.

Stanwin Casement Full Size Sections



Stanwin Casement Types and Sizes

STANWIN CASEMENT TYPES AND SIZES

GLASS SIZES

ALL SINGLE SIDE HINGED VENTILATORS SHOWN ON THIS SHEET ARE LEFT HAND (L), EITHER LEFT HAND (L) OR RIGHT HAND (R) CAN BE FURNISHED WHEN SPECIFIED.

TRANSOM TYPES

TILT-IN TYPES

WINDOW TYPES

SPECIAL STANDARD STOCK-ALL OTHERS

GLASS SIZE "Z" TO TEMPLATE

NOTE:
TOTAL OR PARTIAL MUNTIN OMISSION IS PERMISSIBLE PROVIDED REMAINING MUNTINS ARE IN STANDARD POSITION.

GLASS SIZES

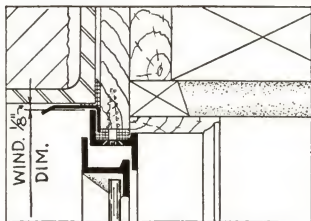
A = 8" x 12"
B = 8 1/4" x 12 3/8"
C = 8 3/4" x 11 3/8"
D = 1 1/4" x 11 3/8"
E = 8 1/4" x 12"
F = 8 3/4" x 10 3/8"
G = 1 1/4" x 10 3/8"
H = 8 1/2" x 11 3/8"
J = 8 1/2" x 12 3/8"
K = 8 1/2" x 10 3/8"
L = 10" x 12"
M = 8 1/2" x 12"
N = 8 3/4" x 12 3/8"
O = 8 3/4" x 12"
P = 7 3/4" x 9 3/4"
Q = 8 3/4" x 9 3/4"
R = 8 3/4" x 11"
S = 8" x 9 3/4"
T = 8 1/2" x 11"
X = 8" x 10 3/8"
Y = 8 3/4" x 10 3/8"
Z = 8 1/4" x 10 3/8"
3 = 8" x 10 3/8"
4 = 8" x 9 3/8"

GLASS SIZE "Z" TO TEMPLATE

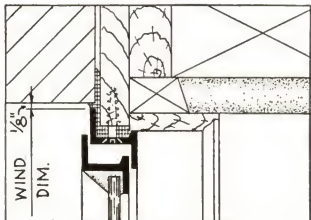
STANWIN'S 100% FIXED AVAILABLE IN ALL ABOVE DIMENSIONS (EXCEPT "TILT-IN" TYPES)

Stanwin Casement Installation Details

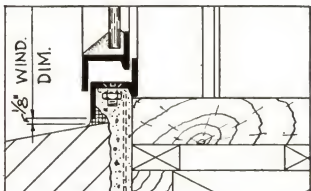
NOTE: INTERIOR, ROUGH WALL DIMENSIONS MUST ALLOW AMPLE SPACE FOR FURRING, PLASTER, TRIM, STOOL, SHADES, STORM SASH, SCREENS AND HARDWARE INDICATED IN THESE TYPICAL DETAILS.



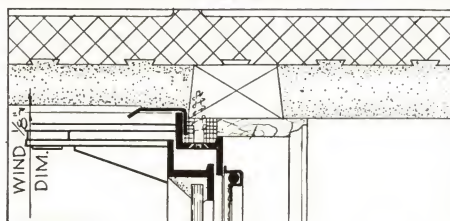
HEAD



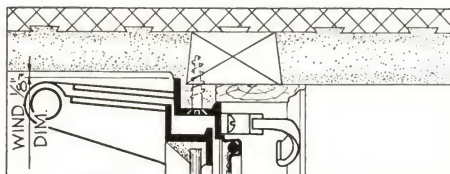
JAMB



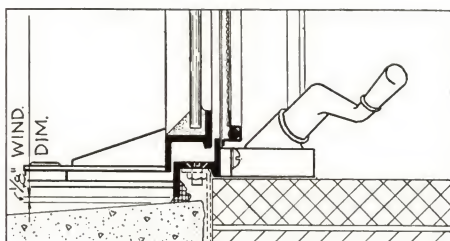
SILL
BRICK VENEER



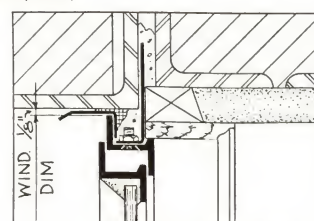
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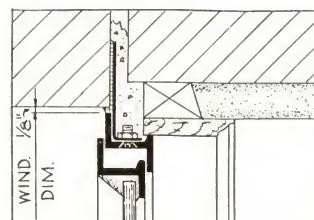
JAMB



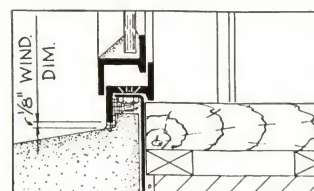
SILL
TILE & STUCCO



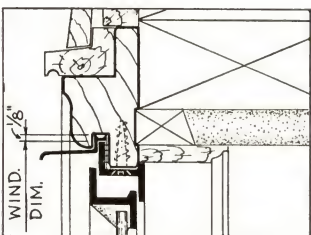
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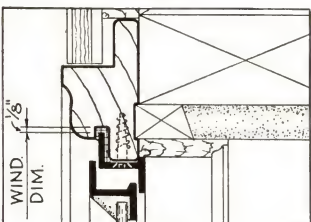
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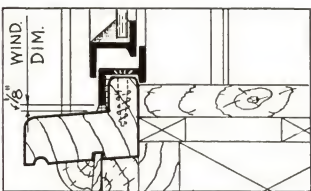
SILL
SOLID BRICK



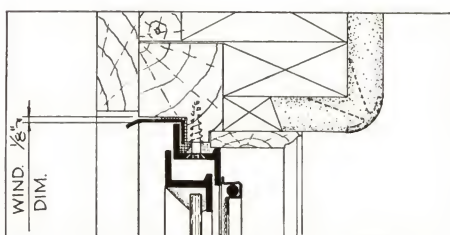
HEAD



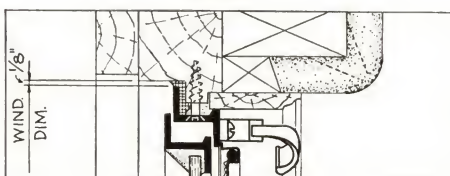
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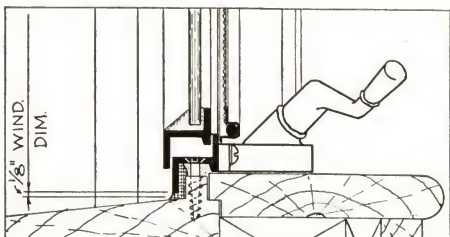
SILL
REDWOOD SURROUNDS



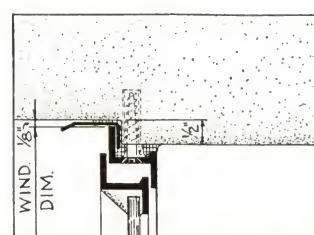
HEAD



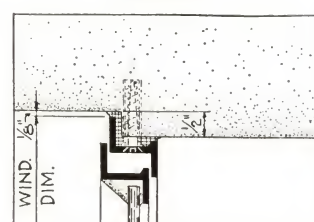
JAMB



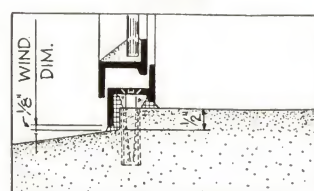
SILL
FRAME



HEAD



JAMB



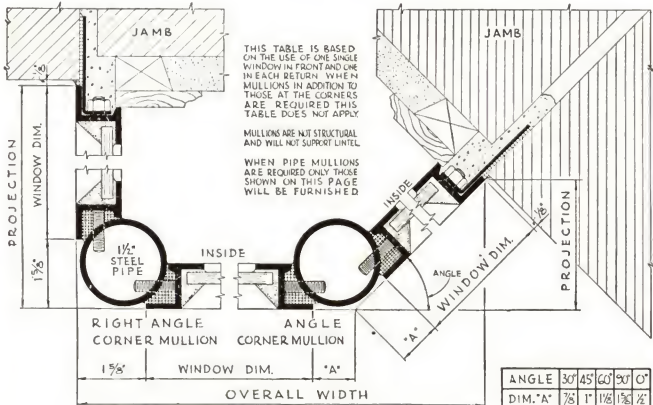
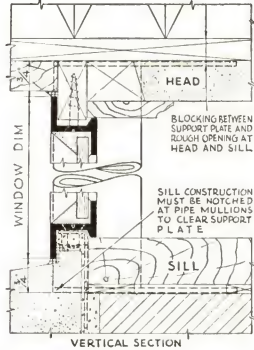
SILL
STONE

Stanwin Steel Casements

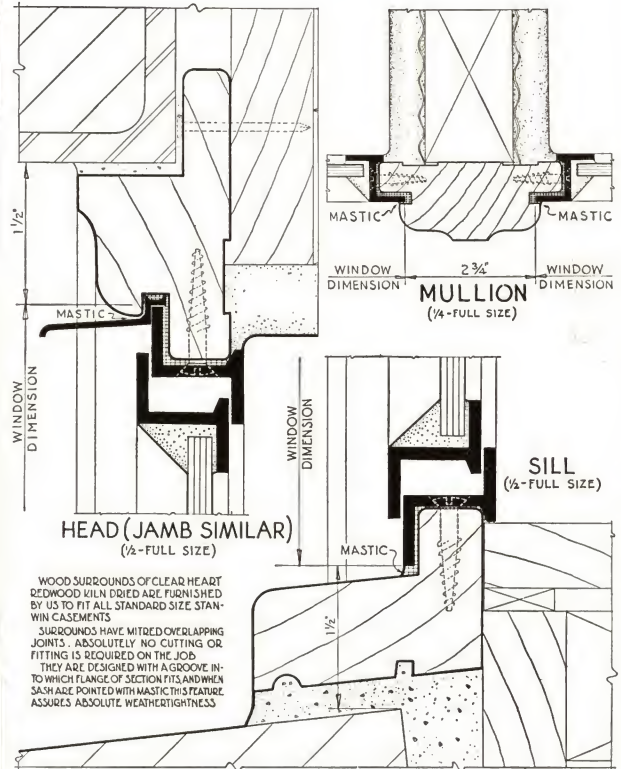
BAY WINDOWS

OVERALL WIDTHS (OW) FOR BAY WINDOWS

	30° SPLAY	45° SPLAY	60° SPLAY	90° SQUARE
FOR ONE LIGHT WIDE RETURN				
3 LIGHTS IN FRONT SECTION	P=4 1/8" 30"	P=5 1/8" 45"	P=12 1/8" 60"	P=14 1/8" 90"
4 LIGHTS IN FRONT SECTION	4'-8 3/8"	4'-4 1/8"	3'-11 1/8"	2'-10 3/8"
6 LIGHTS IN FRONT SECTION	5'-3"	4'-11"	4'-5 5/8"	3'-4 5/8"
8 LIGHTS IN FRONT SECTION	6'-0 1/8"	6'-5 1/8"	5'-11 3/8"	4'-10 3/8"
FOR 2 LIGHT WIDE RETURN				
3 LIGHTS IN FRONT SECTION	P=10" 30"	P=14 1/4" 45"	P=17 1/2" 60"	P=20 1/4" 90"
4 LIGHTS IN FRONT SECTION	5'-7 1/2"	5'-1 1/8"	4'-5 1/8"	2'-10 3/8"
6 LIGHTS IN FRONT SECTION	6'-4 1/8"	5'-7 7/8"	4'-11 7/8"	3'-4 5/8"
8 LIGHTS IN FRONT SECTION	7'-7 1/8"	7'-2"	6'-6"	4'-10 3/8"
	9'-2 1/8"	8'-8 1/4"	8'-0 1/4"	6'-5"

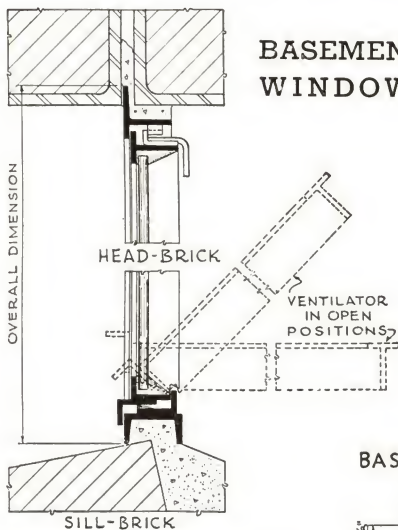


WOOD SURROUNDS



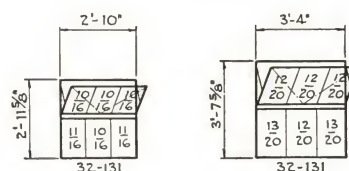
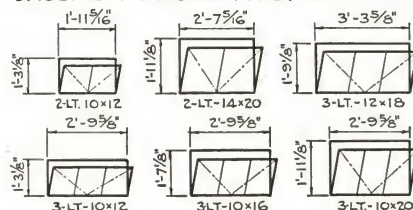
Basement and Utility Windows

BASEMENT WINDOWS

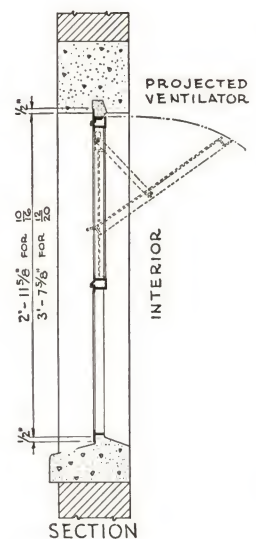


WINDOWS ARE LOCKED WITH A CAM ACTION LOCK; ARE PROVIDED AT THE JAMBS WITH STEEL ANGLE MASON GUIDES; HAVE A LEAK PROOF SILL AND ALL JOINTS IN FRAME AND VENT ARE FULLY WELDED INSURING MAXIMUM STRENGTH.

BASEMENT WINDOW TYPES AND SIZES



UTILITY WINDOWS ARE ESPECIALLY SUITABLE FOR USE IN GARAGES, STORES OR BUILDINGS WITH AREAWAYS BELOW GRADE. THE BOTTOM PORTION IS FIXED WHILE THE UPPER PORTION PROJECTS IN AND HAS HEAVY SPRING CATCH FOR LOCKING SECURELY SHUT.



UTILITY WINDOWS

Federal Arc Welded Industrial Windows

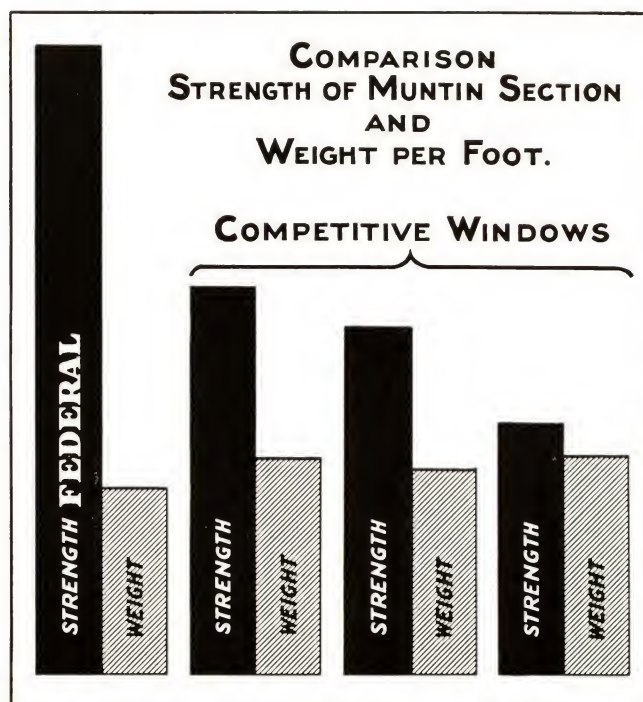
your assurance of full section strength . . . trouble-free installation and performance . . . long-time economy

HOW FEDERAL MANUFACTURING METHODS PROTECT YOU—Ever since their introduction sixteen years ago, Federal Arc Welded Windows have occupied a unique position in the building industry, being the only windows with all joints fully welded. Federal joints are welded along the full line of intersection of the two members, both in face and in depth. All overlapping surfaces and openings between butt edges are eliminated. This assures you that no crevices exist where moisture can seep in and set up corrosion, resulting in eventual failure of the joint structure. Muntins are continuous from jamb to jamb, except in ventilators where they are continuous from head to sill. They have no copes, cut-outs, or reduction in section. Vertical muntins in fixed portions of windows, and horizontal muntins in ventilators, are individual pieces coped to fit the members to which they join. Welding of all joints and connections is continuous along contact lines both in face and depth.

MAXIMUM STRENGTH DEVELOPED—Being fully welded, the full section strength of Federal Arc Welded Windows is utilized, both in the plane of the windows and vertically to the face, which latter is the direction in which the wind load is imposed upon the window. Utilization of the full section strength of the steel produces a window of great lateral rigidity and with less deflection under load than is attainable with substantially larger sections held together with the customary mechanical joints of ordinary windows.



Distorted joint showing the remarkable strength of the weld



COMPARISON OF SECTION WEIGHTS—In making any comparison of the strength and stiffness of window sections, the distribution of metal in the various sections is of great importance. **Weight alone does not make strength.** Since profiles of window sections vary greatly, the only accurate method of comparison is by a mathematical computation (the section modulus) of the strength of the net section, allowing for all cut out portions at the joint. Such a computation, assuming an arbitrary figure of 100 for Federal, both for strength and weight per foot, shows for the ordinary, mechanically-assembled window strength down to 21.7, with a weight of 107.2, and weight up to 138.7, with strength of 39.1. These figures show the impracticability of estimating the strength and resistance to deflection when considering only the depth and weight of sections and disregarding the method of fabricating them into a completed unit.

WHY FEDERAL WINDOWS ARE EASY TO INSTALL—Mechanical joints, with their inherent lack of rigidity, result in a window which often racks out of shape in shipment. This movement in transit destroys the work of fitting and weathering the ventilator in the shop, and necessitates the repetition of this important task by high-priced, and often inexperienced, field labor.

Federal Fully Arc Welded Windows, with ventilators accurately weathered at the shop by experienced fitters working under the most favorable conditions, come to you in perfect shape, because the welded



The muntin joint. Note the smooth exterior surface

Federal Arc Welded Industrial Windows

joints are resistant to distortion in shipment and handling. As a result, tests made by disinterested engineers show the infiltration of air through Federal Ventilators to be remarkably low.

PROTECTIVE COATINGS—Paint, rust-proofing, or galvanizing can be applied to Federal Arc Welded Windows without danger of the coating being ruptured at the joints through racking of the window.

YOU ENJOY ECONOMY OF MAINTENANCE—Federal Arc Welded Windows have no members with moulded faces, ridges, projections, overlapping surfaces, or butt edges to interfere with wire brushing or easy painting, and therefore can be more effectively maintained at low cost than ordinary windows made with these features.

YOU SAVE INSTALLATION TIME AND EFFORT—All hardware is attached in our shop before shipment, an exclusive Federal feature that simplifies and speeds up erection. All Federal operating hardware is of unusually rugged design, affording positive ventilator operation at all times.

FEDERAL CLOSE PIVOT—For horizontally pivoted windows, the hinge or pivot projects only $\frac{5}{8}$ in. beyond the inside face of the window frame. It consists of two substantial pressed steel hinge leaves joined with a sturdy bronze pin, providing a free acting ventilator at all times and insuring against the "freezing" of the hinge through corrosion.

FEDERAL DRAW-TIGHT PUSH BARS—The design of push bar furnished on all horizontally pivoted ventilators, located within convenient reach of the floor level, is an exclusive patented feature on Federal Windows. The push bar is attached to the lower rail of the vent at one side of the vent center. The push bar construction includes a heavy steel hinge affording a universal joint for free movement in the opening and closing operation. In the corresponding location on the opposite side of the

vent is attached a locking clip. Midway between these points, and located on the window frame, is a strike plate acting as a fulcrum for the push bar, which when in a closed position, serves to draw the vent tightly shut at both lower corners.

FEDERAL BRONZE FRICTION GUIDES—Each of the friction guides attached to the upper corners of all Federal projected ventilators consists of a heavy solid bronze pin with the end slotted to form a yoke. Inset at the bottom of the slot is a hardened steel ball which, in turn, slides upon the guide angles at both jambs. Friction is furnished by the pressure of a spring in back of the steel ball, forcing it into contact with the steel guides. This exclusive Federal friction-shoe design eliminates all binding and scraping of the friction guide against the side members, and insures a smooth and positive operation of ventilator at all times.

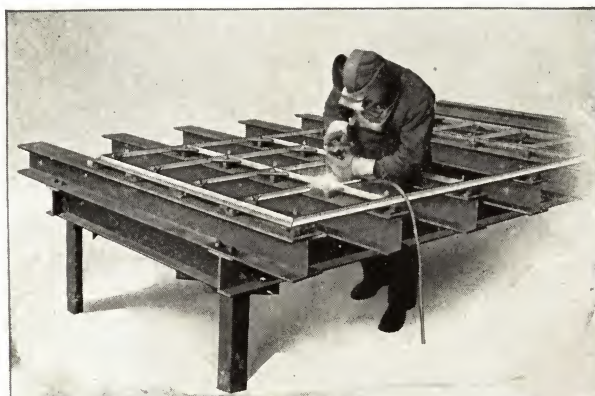
ADJUSTABLE MULLIONS—Federal vertical mullions, adjustable both vertically and horizontally, are easy to set. They eliminate any need for prys, drifts or hammering, to force window units into place.

FEDERAL INDUSTRIAL DOORS—The neat appearance, strength, durability and economy of Federal steel doors fully match the high quality standards set by Federal window products. With specially designed hardware, sturdy enough to stand up under the most severe usage, Federal Industrial Doors offer an economical and dependable product for general industrial use.

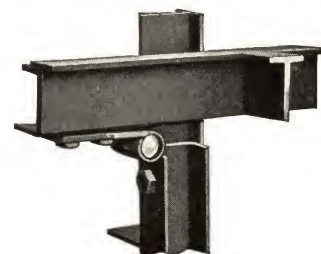
FEDERAL TYPES AND SIZES—All masonry opening dimensions and standard window designs as offered in Federal products are in accordance with the standards promulgated by the Division of Simplified Practice of the U. S. Bureau of Standards. They are also in accordance with the standards for sizes and specifications recommended by the Metal Window Institute.



Double contact weathering all four sides of the Ventilators



Specially designed welding tables insure accurate dimensions and absolute squareness



Pressed steel hinge with brass pin

Federal Arc Welded Industrial Windows

SPECIFICATIONS—PIVOTED WINDOWS

GENERAL—Steel windows shall be of the Federal arc welded horizontally pivoted type as manufactured by Crittall-Federal Inc., of Waukesha, Wisconsin, or approved equal and shall be of types and sizes as indicated on drawings.

MATERIALS—Window sections shall be of hot rolled new billet steel, not less than $\frac{1}{8}$ " in thickness. Applied weathering shall be not less than 16 gauge.

CONSTRUCTION—Steel windows shall be designed for inside putty glazing (or for glazing with steel angles). All joints shall be electric arc welded in full depth and across all faces. Ventilators shall be of the horizontal pivoted type with closed knuckle pivots and bronze hinge pins. Continuous double contact weathering shall be provided around all four sides of ventilators.

HARDWARE—Each ventilator within convenient reach from the floor level shall be equipped with a push bar securely locking the windows when in a closed position. For ventilators located beyond convenient reach from the floor, furnish a malleable iron cam handle controlled by an endless chain running

through a roller bracket at the head of the vent.

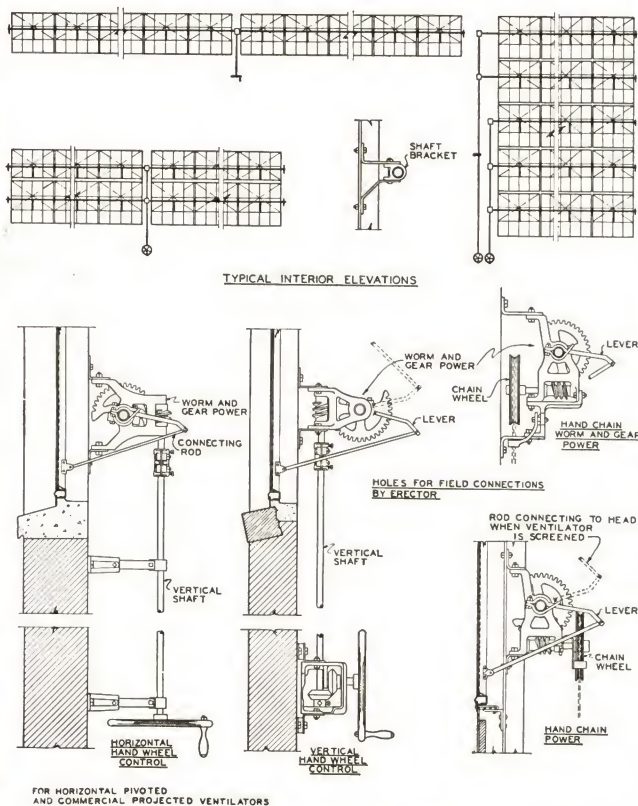
ERECTION FITTINGS shall be supplied by window manufacturer in accordance with installation details.

PAINTING—All steel material shall be given a dip coat of manufacturer's standard grey mineral oxide paint before shipment.

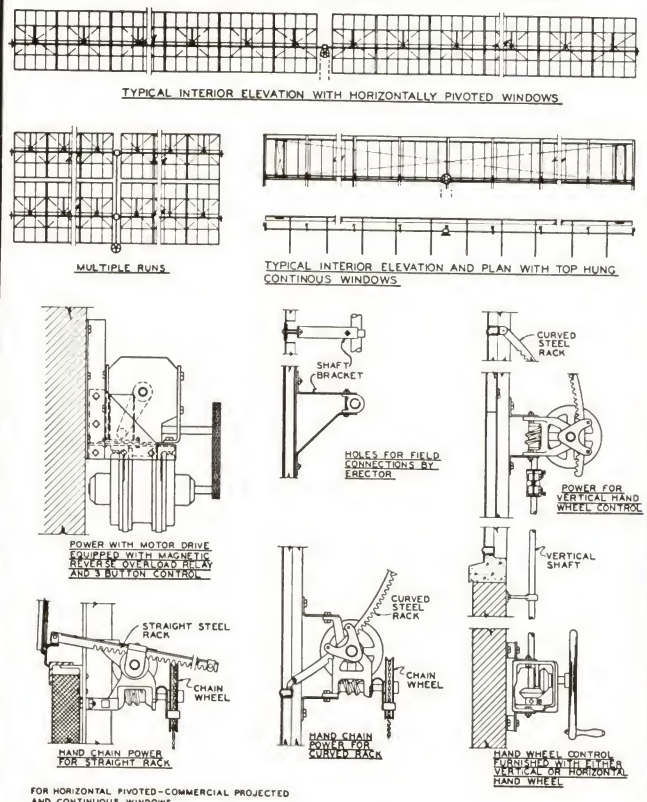
ERECTION—All steel windows shall be set plumb and true, properly aligned, securely anchored and all ventilators shall be adjusted before glazing.

MECHANICAL OPERATORS for Horizontally Pivoted and Commercial Projected Windows—Lever Arm, Screw Type or Rack and Pinion Operators, where called for on drawings, shall have shaft brackets and supports adjusted to allow free turning of the shaft without binding. Shaft must be level and straight. Arms, connecting rods and racks shall be adjusted for each Ventilator to compensate for torsion in the shaft. Each ventilator shall be drawn tight when in closed position. After adjusting the Operator, all bolts, screws, etc., shall be set up tight and the Operator shall work smoothly and without binding.

LEVER ARM OPERATOR

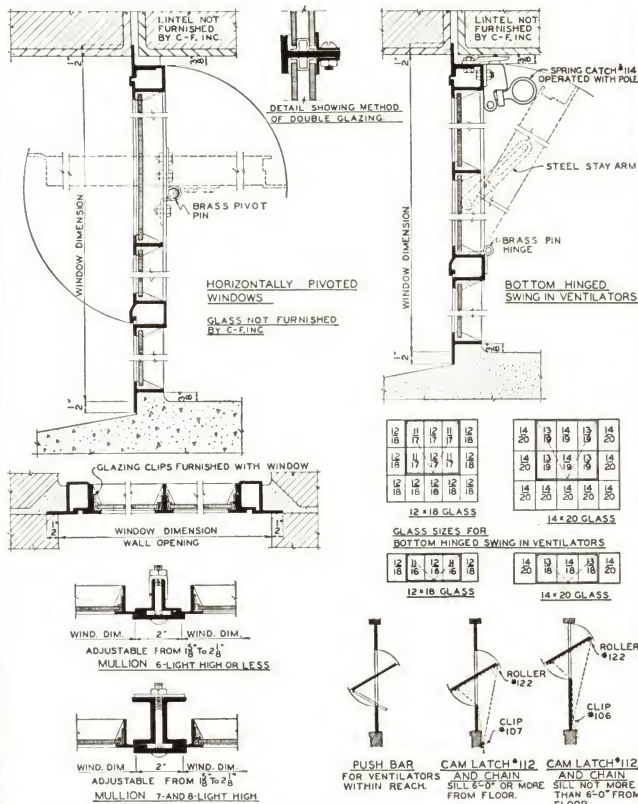


RACK AND PINION OPERATOR



HORIZONTALLY PIVOTED WINDOWS

TYPICAL SECTIONS



Federal Arc Welded Industrial Windows

COMMERCIAL PROJECTED WINDOWS

SPECIFICATIONS

GENERAL—Steel windows shall be of the Federal arc-welded commercial projected type as manufactured by Crittall-Federal Inc., of Waukesha, Wisconsin, or approved equal.

CONSTRUCTION—Steel Windows shall be designed for inside glazing or for glazing with steel angles. (Outside glazing is also available, if desired.) All joints shall be electric arc welded in full depth and across all faces. Ventilators shall be of the projected type opening down and out at the bottom (or up and in at the top).

HARDWARE—Hardware shall be of substantial design affording convenient and positive operation of all ventilators from the floor level. (EXPLOSION HARDWARE, if specified, can be furnished in this ventilator design.)

PAINTING—All steel material shall be given a dip coat of manufacturers standard grey mineral oxide paint, before shipment.

ERECTION—All steel windows shall be set plumb and true, properly aligned, securely anchored and all vents shall be carefully adjusted before glazing.

SCREENS

FOR PIVOTED AND PROJECTED VENTILATORS

SPECIFICATIONS

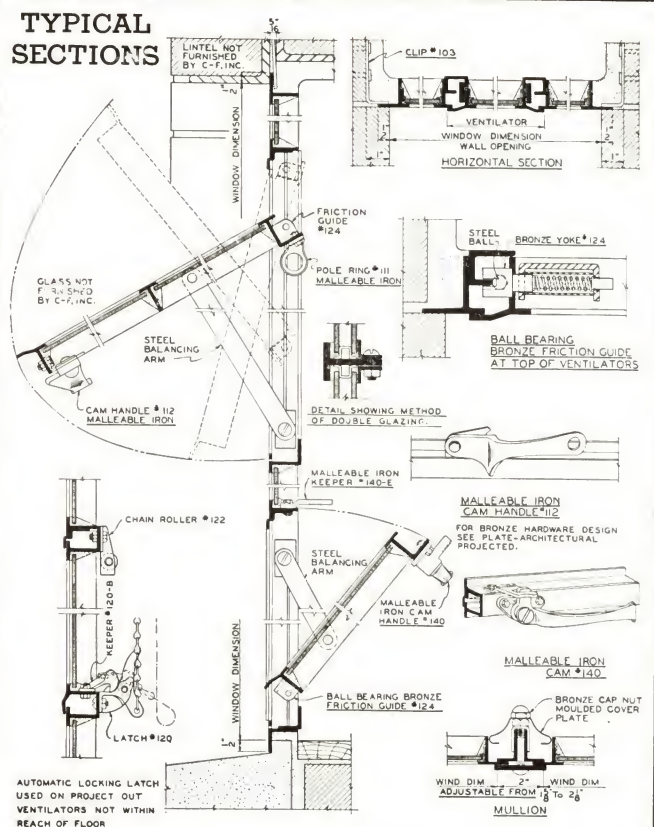
MATERIAL—Frames shall be solid drawn (steel) (bronze) (aluminum) sections of special design. Cloth shall be 16 mesh bronze wire (specify other mesh). Box frames, clips and corner boxes shall be 16 gauge sheet steel.

CONSTRUCTION—Frame members shall be continuous from head to sill and jamb to jamb, mitered at corners and Electric Welded. Splines for holding Cloth in frames shall be copper wire. Screen Cloth shall be 16 mesh (specify other mesh) bronze wire, stretched flat and without wrinkles or waves.

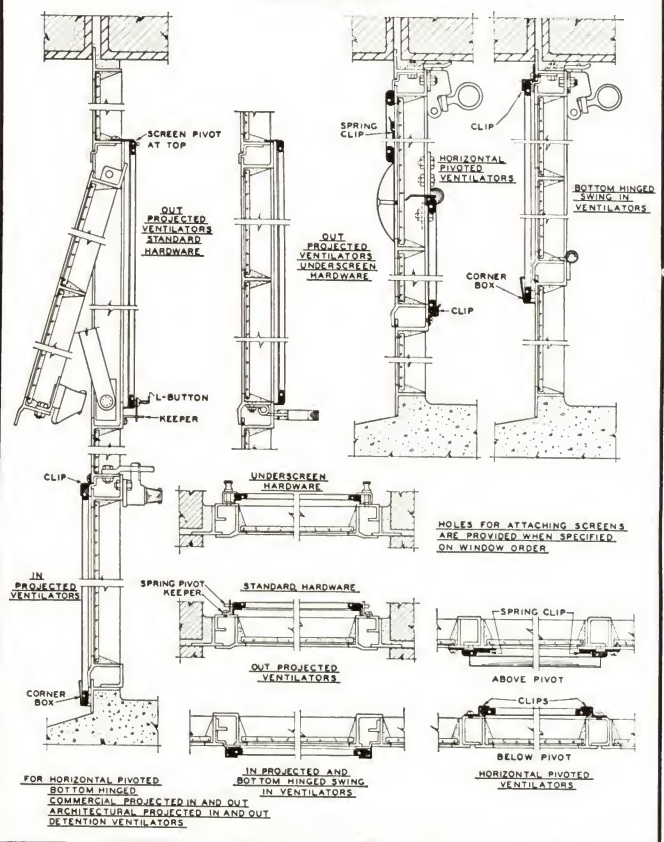
PAINT—Frames, box frames, spring clips, corner boxes and baffles shall be given one coat of black enamel before shipment.

INSTALLATION—Windows with Ventilators specified to be screened, shall be prepared at factory for attaching Screens after erection.

TYPICAL SECTIONS



SCREENS



Federal Arc Welded Industrial Windows

DETENTION WINDOWS

INDUSTRIAL DETENTION WINDOWS shall have Horizontally Pivoted (or Commercial In or Out Projected) Ventilators. For Horizontally Pivoted and Commercial Out-Projected Ventilators, malleable iron Cam Handle Hardware shall be supplied. For Commercial In-Projected Ventilators, malleable iron Spring Cam Hardware is used. (Hardware can be furnished in bronze, if specified.)

PROTECTION WINDOWS—The ventilator if outside, is Commercial Out-Projected; if inside may be either Bottom Hinged Swing In or Commercial In-Projected.

Hardware for outside Ventilator shall be malleable iron Cam Handle or Automatic Locking Latch; for inside Ventilators is a Spring Catch, bolted to the head of the Ventilator. Bronze Hardware can be furnished, if specified.

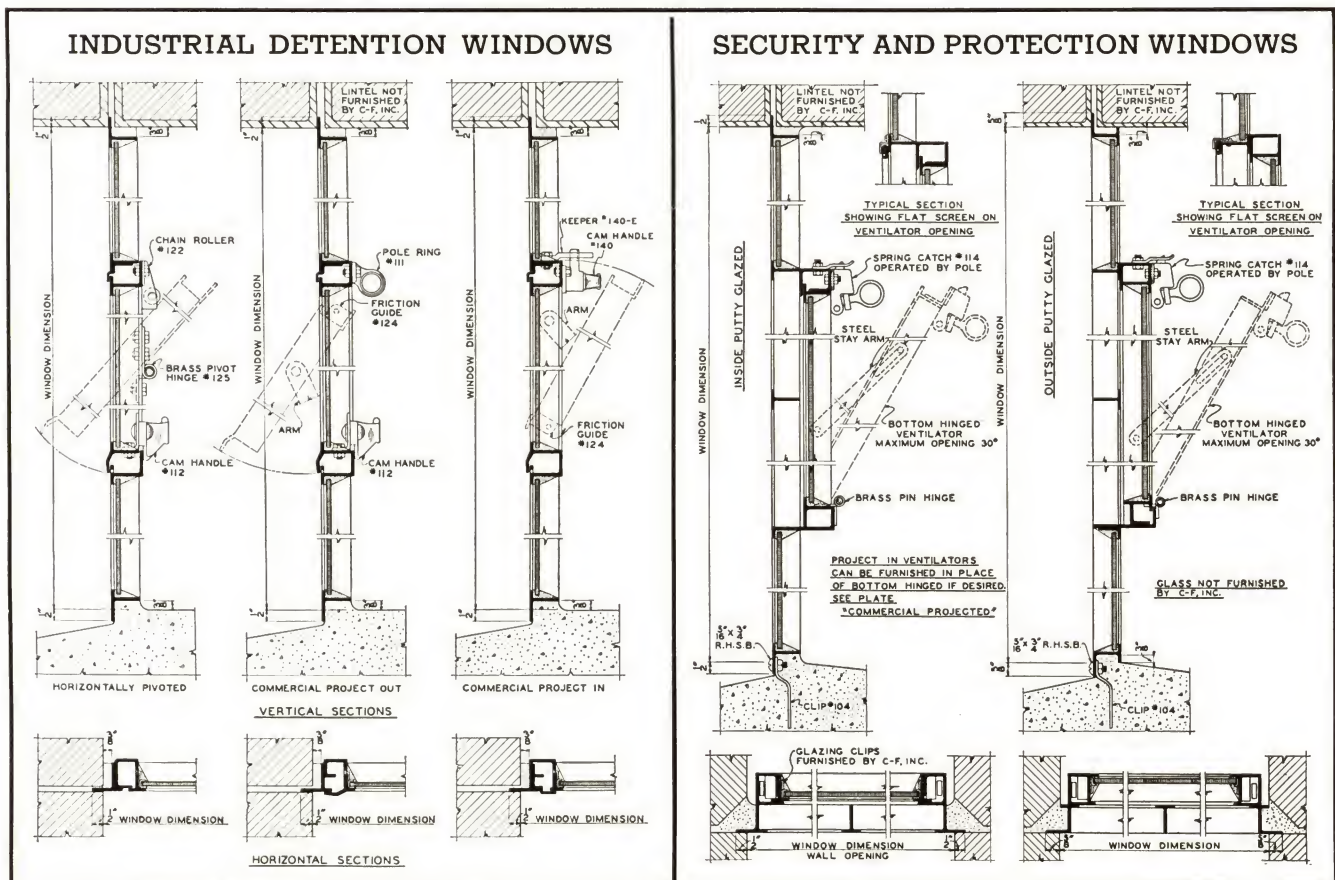
Windows can be putty glazed with glass either on the inside or outside of the face of the Window, as specified.

SECURITY WINDOWS are in all respects similar to Protection Windows above, except that the glass size of the main frame is 6" x 18" and of the Ventilator 12" x 18".



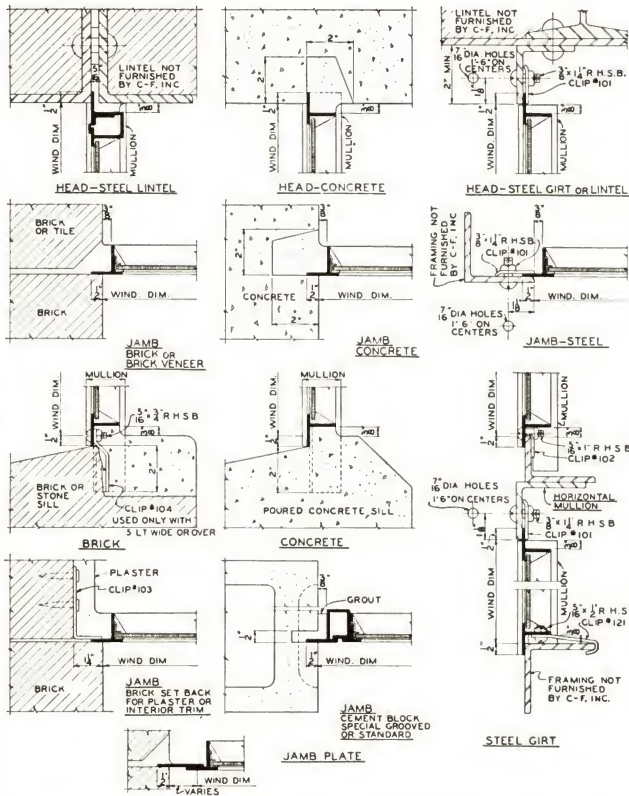
FEDERAL PROTECTION WINDOW

The uninterrupted section forming the bottom of Federal's vent frame guarantees the elimination of water leakage at this critical point. See detail below.



COLLATERAL DETAILS

INSTALLATION DETAILS



GLASS SIZES — COMBINATIONS FOR PIVOTED AND COMMERCIAL PROJECTED WINDOWS

12 x 18 Height of Opening	Lights High	14 x 20 Height of Opening	Number of Lights in Width of Opening	Number of Units To Fill Opening	Number of Lights in Each Unit and Number Units to Fill Opening
1'-7 ¹ / ₄ "	1	1'-9 ¹ / ₄ "			
3'-1 ⁵ / ₈ "	2	3'-5 ⁵ / ₈ "			
4'-8"	3	5'-2"			
6'-2 ³ / ₈ "	4	6'-10 ³ / ₄ "			
7'-8 ³ / ₄ "	5	8'-6 ³ / ₄ "			
9'-3 ¹ / ₈ "	6	10'-3 ¹ / ₈ "			
10'-9 ¹ / ₂ "	7	11'-11 ¹ / ₂ "			
Width of Opening					
12×18		14×20			
2'-1 ⁵ / ₈ "		2'-5 ⁵ / ₈ "	2	1	2
3'-2"		3'-8"	3	1	3
4'-2 ³ / ₈ "		4'-10 ³ / ₈ "	4	1	4
4'-5 ¹ / ₄ "		5'-1 ¹ / ₄ "	4	2	2, 2
5'-2 ³ / ₄ "		6'-0 ³ / ₄ "	5	1	5
6'-3 ¹ / ₈ "		7'-3 ¹ / ₈ "	6	1	6
6'-6"		7'-6"	6	2	3, 3
7'-6 ³ / ₈ "		8'-8 ³ / ₈ "	7	2	4, 3
8'-6 ³ / ₄ "		9'-10 ³ / ₄ "	8	2	4, 4
9'-10"		11'-4"	9	3	3, 3, 3
10'-7 ¹ / ₂ "		12'-3 ¹ / ₂ "	10	2	5, 5
10'-10 ³ / ₈ "		12'-6 ³ / ₈ "	10	3	3, 4, 3
11'-10 ³ / ₄ "		13'-8 ³ / ₄ "	11	3	3, 5, 3
11'-10 ³ / ₄ "		13'-8 ³ / ₄ "	11	3	4, 3, 4
12'-8 ¹ / ₄ "		14'-8 ¹ / ₄ "	12	2	6, 6
12'-11 ¹ / ₈ "		14'-11 ¹ / ₈ "	12	3	4, 4, 4
13'-2"		15'-2"	12	4	3, 3, 3, 3
13'-11 ¹ / ₂ "		16'-1 ¹ / ₂ "	13	3	4, 5, 4
13'-11 ¹ / ₂ "		16'-1 ¹ / ₂ "	13	3	5, 3, 5
14'-11 ⁷ / ₈ "		17'-3 ⁷ / ₈ "	14	3	4, 6, 4
14'-11 ⁷ / ₈ "		17'-3 ⁷ / ₈ "	14	3	5, 4, 5
15'-2 ³ / ₄ "		17'-6 ³ / ₄ "	14	4	3, 4, 4, 3
16'-0 ¹ / ₄ "		18'-6 ¹ / ₄ "	15	3	5, 5, 5
16'-0 ¹ / ₄ "		18'-6 ¹ / ₄ "	15	3	6, 3, 6
16'-6"		19'-0"	15	5	3, 3, 3, 3, 3
17'-0 ⁵ / ₈ "		19'-8 ⁵ / ₈ "	16	3	5, 6, 5
17'-0 ⁵ / ₈ "		19'-8 ⁵ / ₈ "	16	3	6, 4, 6
17'-3 ¹ / ₂ "		19'-11 ¹ / ₂ "	16	4	4, 4, 4, 4
17'-3 ¹ / ₂ "		19'-11 ¹ / ₂ "	16	4	3, 5, 5, 3
17'-6 ³ / ₈ "		20'-2 ³ / ₈ "	16	5	3, 3, 4, 3, 3
18'-1"		20'-11"	17	3	6, 5, 6
18'-6 ³ / ₄ "		21'-4 ³ / ₄ "	17	5	3, 4, 3, 4, 3
19'-1 ³ / ₈ "		22'-1 ³ / ₈ "	18	3	6, 6, 6
19'-4 ¹ / ₄ "		22'-4 ¹ / ₄ "	18	4	3, 6, 6, 3
19'-4 ¹ / ₄ "		22'-4 ¹ / ₄ "	18	4	4, 5, 5, 4
19'-7 ¹ / ₈ "		22'-7 ¹ / ₈ "	18	5	3, 4, 4, 4, 3
20'-7 ¹ / ₂ "		23'-9 ¹ / ₂ "	19	5	3, 5, 3, 5, 3
21'-5"		24'-9"	20	4	5, 5, 5, 5
21'-5"		24'-9"	20	4	4, 6, 6, 4
21'-7 ⁷ / ₈ "		24'-11 ⁷ / ₈ "	20	5	4, 4, 4, 4, 4
21'-10 ³ / ₄ "		25'-2 ³ / ₄ "	20	6	3, 3, 4, 4, 3, 3



FEDERAL SECURITY WINDOW

In all detention types the additional strength resulting through the full arc-welded construction establishes the Federal product as outstandingly superior in the detention window field.

Federal Arc Welded Industrial Windows

ARCHITECTURAL PROJECTED WINDOWS

SPECIFICATIONS

GENERAL—Steel windows shall be of the Federal arc welded architectural projected design as manufactured by Crittall-Federal, Inc., of Waukesha, Wisconsin, or approved equal.

CONSTRUCTION—Steel windows shall be designed for inside glazing with continuous steel angles held in place with round head brass screws. (Outside or inside putty glazing also available if desired.) All joints shall be electric arc welded in full depth and across all faces. Ventilators shall be of the projected type opening down and out at the bottom (or up and in at the top).

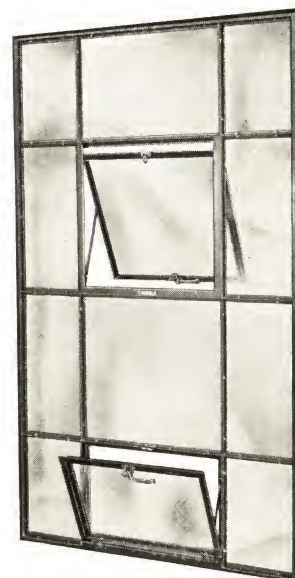
HARDWARE—Hardware shall be of solid bronze, in attractive and substantial design, affording convenient and positive operation of all ventilators from the floor level.

PAINTING—All steel material shall be given a dip coat of manufacturers standard grey mineral oxide paint before shipment.

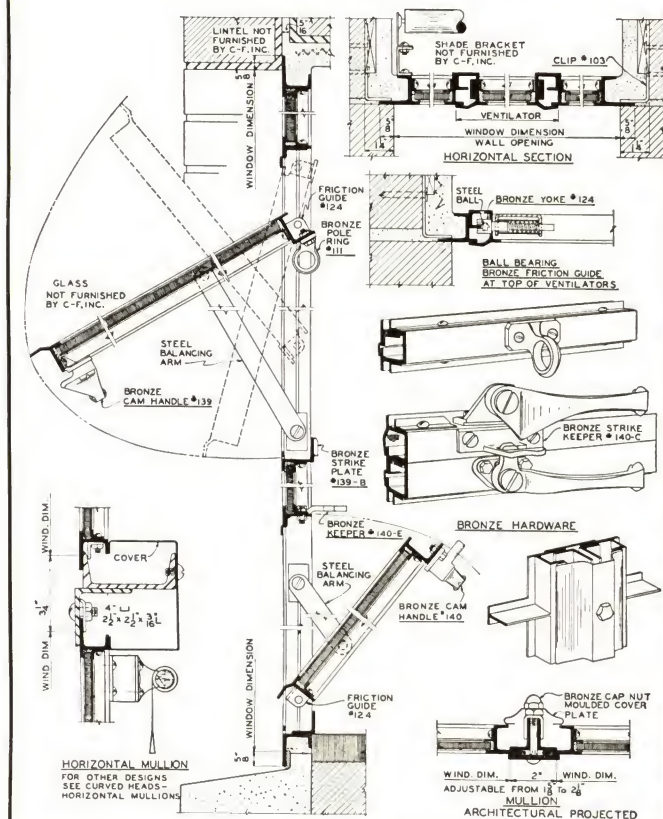
ERECTION—All steel windows shall be set plumb and true, properly aligned, securely anchored and all vents shall be carefully adjusted before glazing.

ARCHITECTURAL PROJECTED WINDOW FROM THE INSIDE

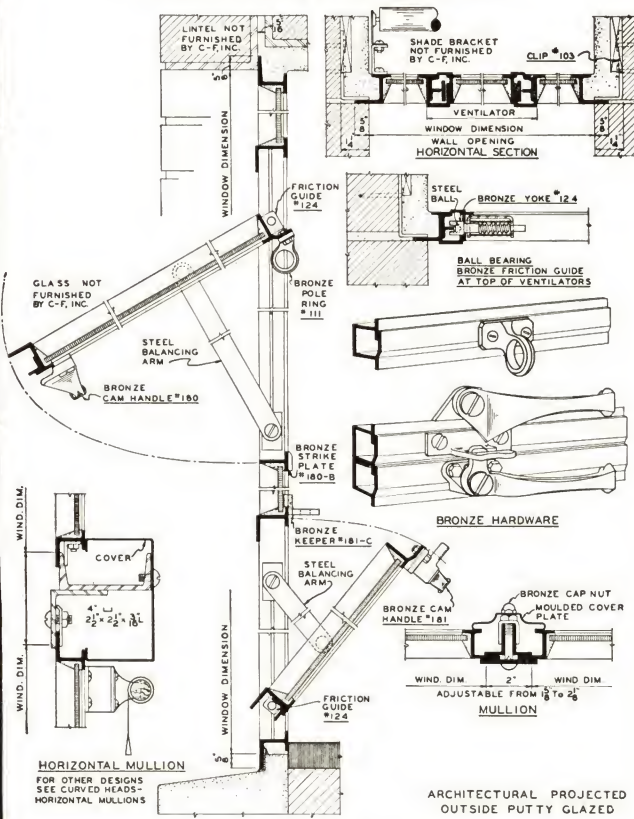
Federal Architectural Projected Windows are made in all standard types and sizes.



INSIDE ANGLE GLAZED



OUTSIDE PUTTY GLAZED



Federal Arc Welded Industrial Windows

CONTINUOUS WINDOWS AND OPERATORS

SPECIFICATIONS

GENERAL—Steel windows shall be of the Federal arc welded continuous design as manufactured by Crittall-Federal, Inc., of Waukesha, Wisconsin, or approved equal.

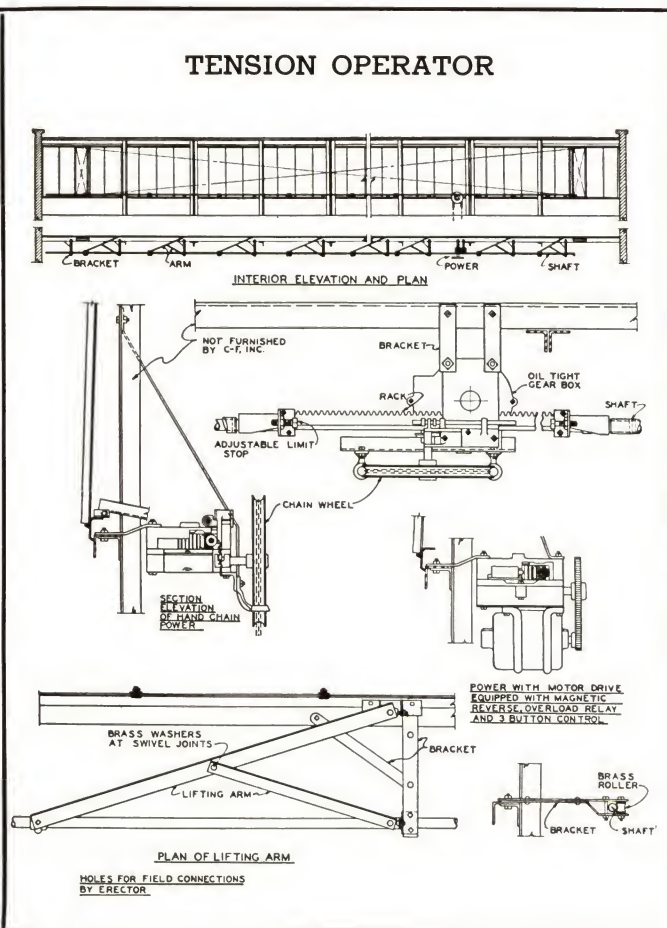
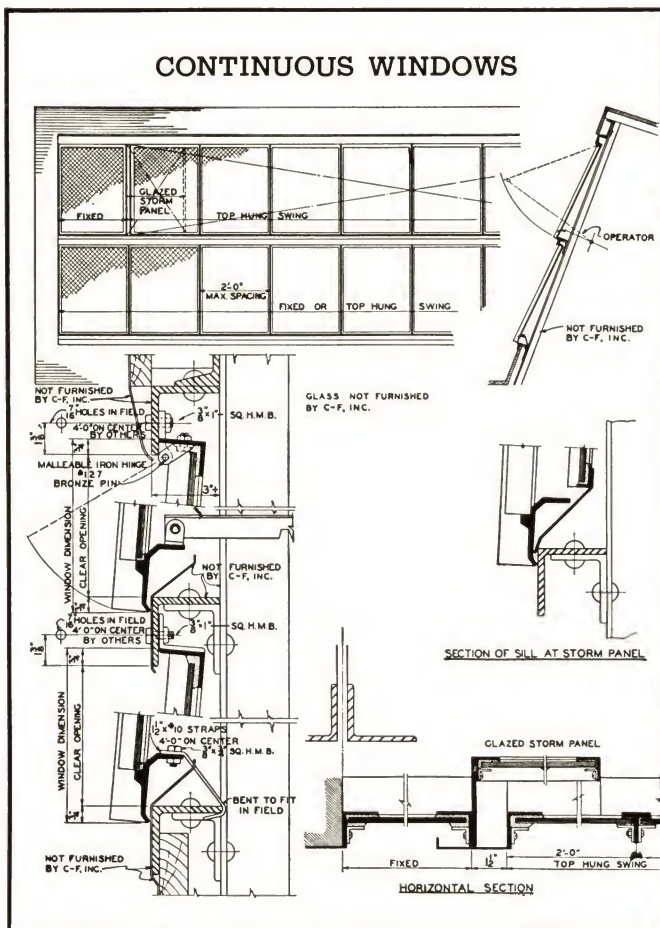
CONSTRUCTION—All material shall be of hot rolled open hearth new billet steel. All joints and connections shall be full welded, continuous along contact lines in full depth and across all faces. Panel sections are joined together by bolts. Storm and end panels shall be included at both ends of each operating run. The design shall provide for positive weathering at all contact points when the window is in a closed position.

MECHANICAL OPERATORS—Operators shall be of tension design with 1" standard pipe supported on steel pipe rollers with brass sleeves and adjustable

connections. The toggle-acting opening mechanism shall be substantial in weight and design, affording positive opening and closing action. The operator power shall consist of a cast iron oil-tight housing in which are assembled a machine cut steel pinion and gear which, in turn, engages with a cast iron machine cut toothed rack. Operator control shall be by hand chain through a cast iron chain wheel and jack chain to within 4'0" from floor. Short runs may be operated by rack and pinion operating device.

PAINTING—All steel material shall be given a coat of manufacturers' standard grey mineral oxide paint, before shipment.

ERECTION—All steel windows shall be set plumb and true and properly aligned. Operators shall be carefully adjusted with all parts working smoothly.



Federal Arc Welded Industrial Windows

INDUSTRIAL DOORS

SPECIFICATIONS

GENERAL—Steel doors shall be of the Federal Heavy (or Light) Industrial type as manufactured by Crittall-Federal, Inc., of Waukesha, Wisconsin, or approved equal.

CONSTRUCTION—Rails and stiles shall be of formed steel tube full welded on all four sides at intersections and joints. Plate panels shall be of not less than No. 14 gauge. Astragals for all double doors shall be of steel.

FRAMES (For Swing Doors Only)—For Heavy type doors, frames shall be of structural steel shapes as detailed on plans. For Light type doors, frames shall be of pressed steel not less than No. 14 gauge in thickness.

HARDWARE—Steel half-surface butt hinges shall be furnished for all swing leaves and for double doors; top and bottom bolts shall be furnished for

the inactive leaf. Locking hardware shall be a lever latch, mortise latch, thumb latch. (Cylinder locks are furnished when specified.)

For slide doors hardware shall include track and trolley, hasp and staple, flush handle, floor guide and door stop.

PAINTING—All steel material shall be given a coat of manufacturers' standard grey mineral-oxide paint before shipment.

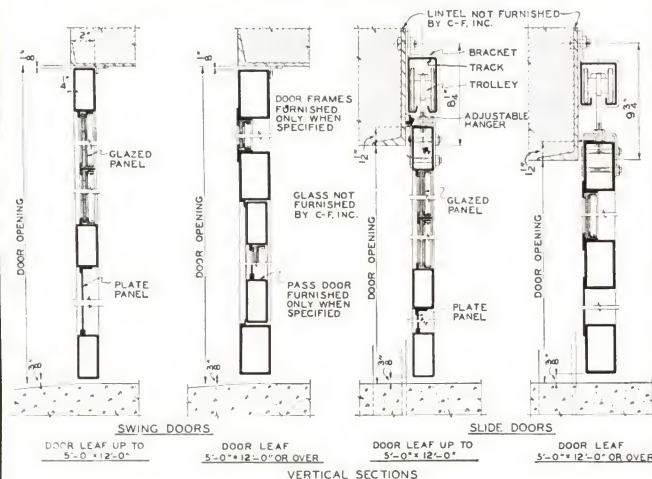
ERECTION—Frames shall be erected square and plumb and proper width maintained at both head and sill of frame, so that doors will hang true and weather properly. Proper clearances must be maintained between doors and frame. (See door drawings.) Hangers and tracks shall be adjusted to allow for proper clearances, both between door and wall and at sill.

HEAVY DOORS

OPENING HEIGHT	SINGLE DOORS					DOUBLE DOORS				
	OPENING WIDTH					OPENING WIDTH				
7'-0"	2'-0"	3'-0"	3'-6"	4'-0"	5'-0"	5'-0"	6'-0"	7'-0"	8'-0"	10'-0"
7'-6"										
8'-0"										
10'-0"										
11'-0"										
12'-0"										
13'-0"										
14'-0"										
15'-0"										

DIMENSIONS GIVEN ARE FOR SWING DOORS ONLY. ALL DIMENSIONS ARE INSIDE MEASUREMENTS OF FRAME.

DIMENSIONS FOR SLIDE DOORS ARE 3" LESS IN WIDTH AND 1 1/2" LESS IN HEIGHT THAN DIMENSION GIVEN.



LIGHT DOORS

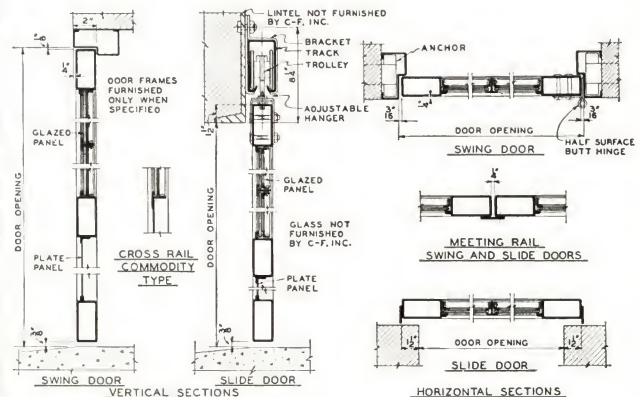
TYPE	COMMODITY TYPE DOORS					
	SINGLE DOORS			DOUBLE DOORS		
SWING DOOR LEAF	A	B	C	D	E	F
OPENING SIZES	2'-6" x 7'-0"	3'-0" x 7'-0"	3'-0" x 10'-0"	5'-0" x 7'-0"	7'-0" x 7'-6"	10'-0" x 10'-0"
SLIDE DOOR						
OPENING SIZES	2'-3" x 6'-10 1/2"	3'-3" x 7'-4 1/2"	4'-9" x 9'-10 1/2"	4'-9" x 6'-10 1/2"	6'-9" x 7'-4 1/2"	9'-9" x 9'-10 1/2"

STANDARD DOOR LEAFS

TYPE	STANDARD DOOR LEAFS					
	G	H	J	K	L	M
SWING DOOR LEAF						
MAX. 5'-0" x 10'-0"						
SLIDE DOOR LEAF						
MAX. 4'-9" x 9'-10 1/2"						

DOORS CAN BE FURNISHED WITH ALL PLATE, WINDOW, OR PLATE AND WINDOW PANELS.

LIGHT INDUSTRIAL SWING AND SLIDE DOORS





Windows

CRITTALL · FEDERAL · INC

WAUKESHA · WISCONSIN

